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Vol. 7, No. 3

Worlds Largest Apple User Group

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- **Telecommunications**
  A Protocol Primer
  Just Learning?
- Telecommunications Security
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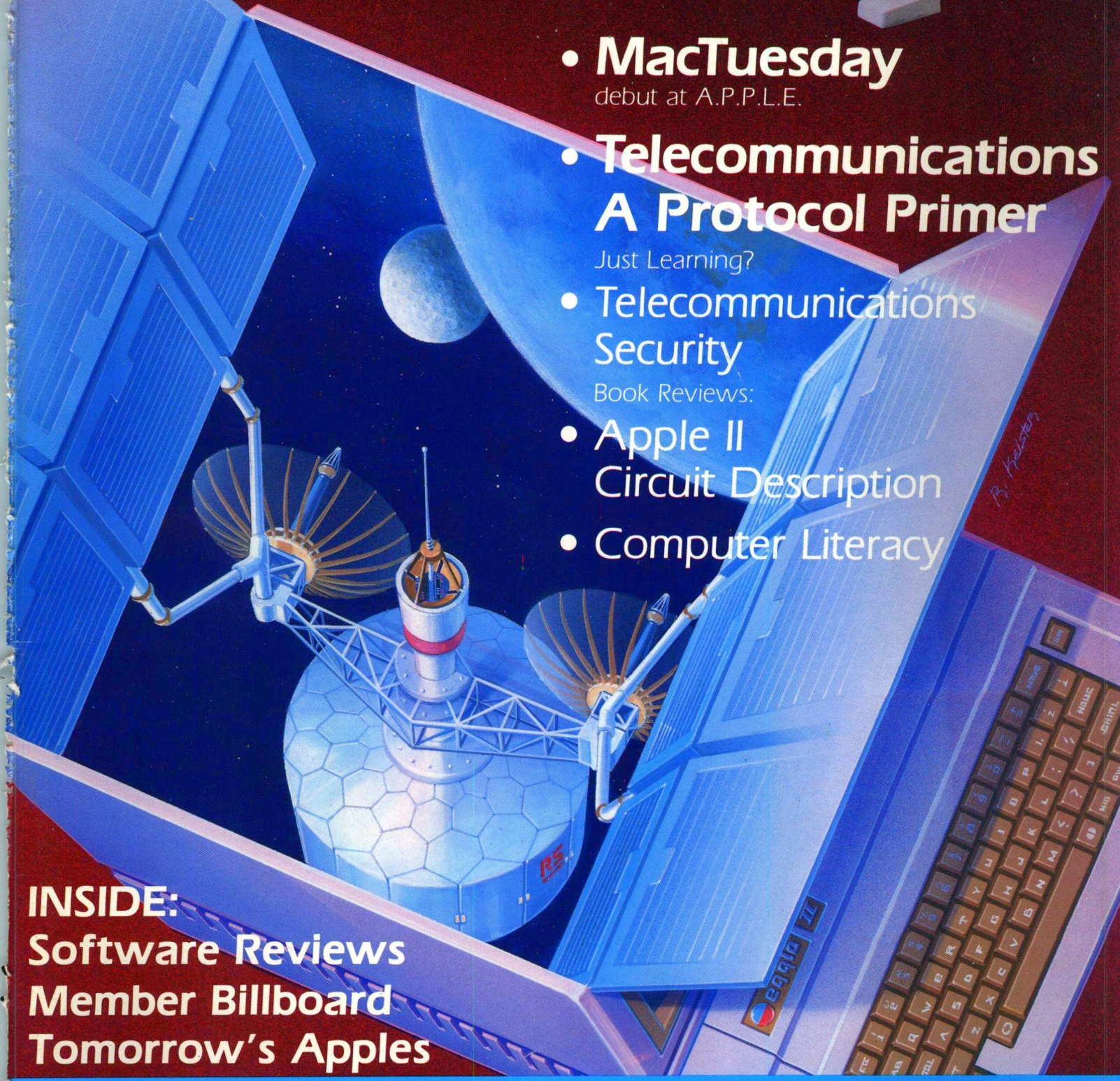
- Apple II Circuit Description
- Computer Literacy



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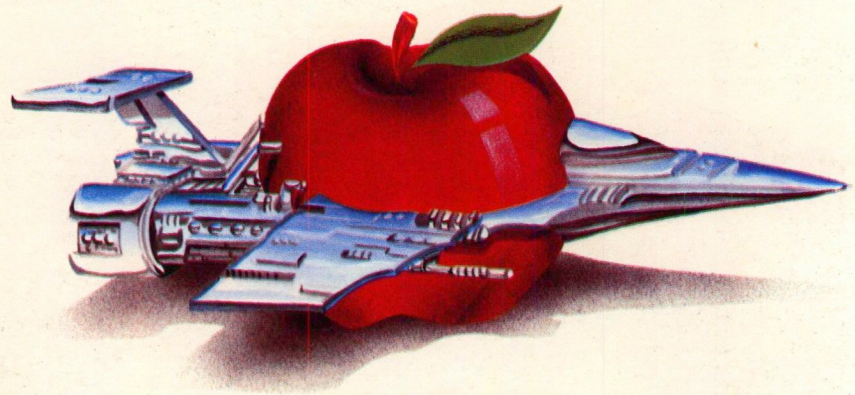

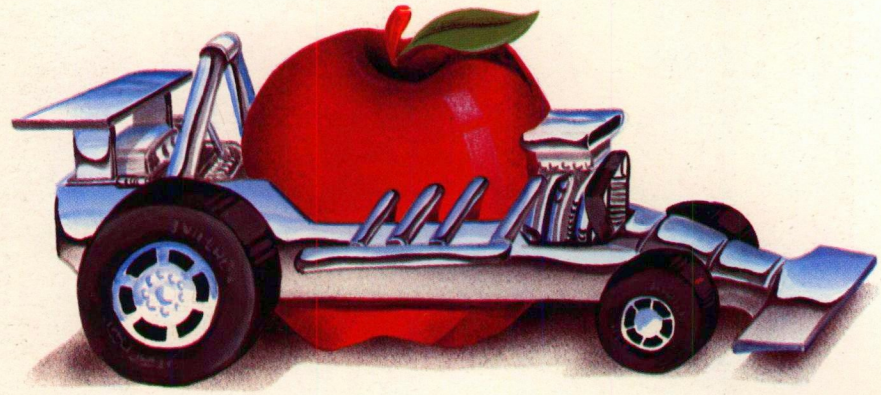

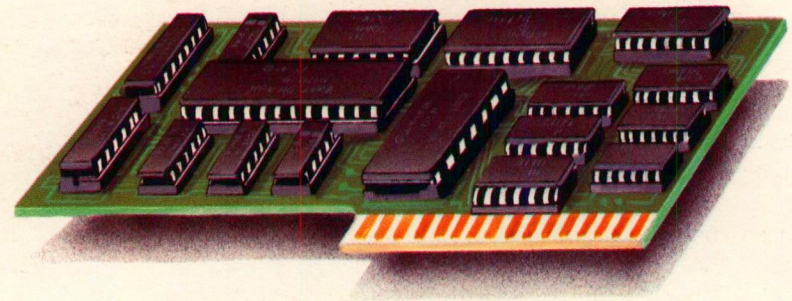

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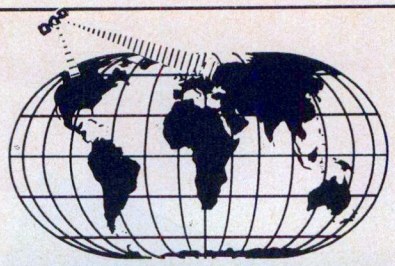

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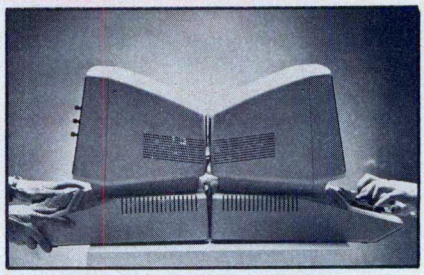

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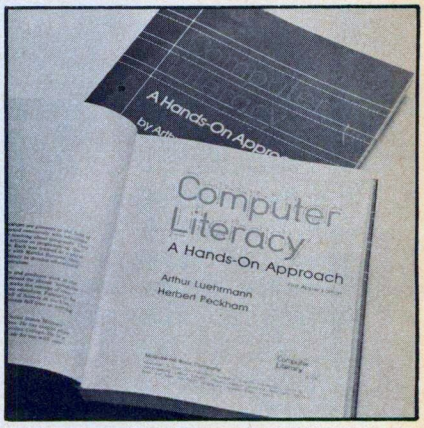

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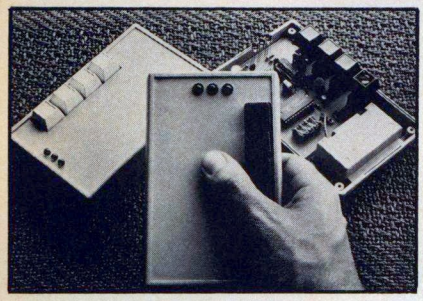

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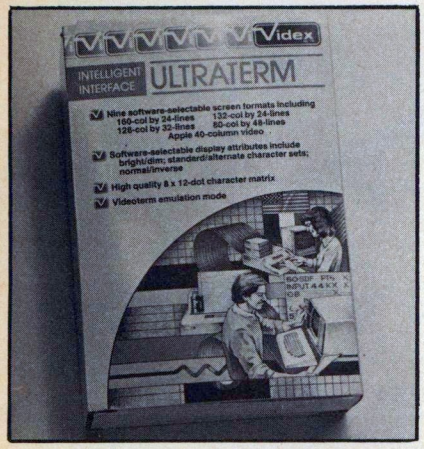

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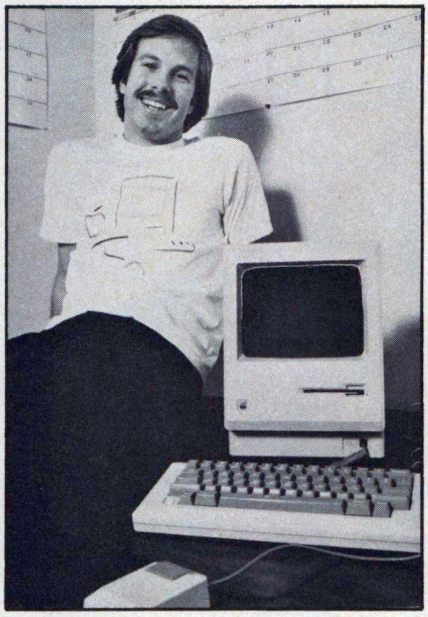

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The beautiful four-color illustrations that appear every month on the front cover of Call —A.P.P.L.E. are available as posters suitable for framing. The Collector Series covers are designed by noted Seattle area graphic artist Ron Kiester, and make an excellent addition to any office or home decor.

See product sheet for details.

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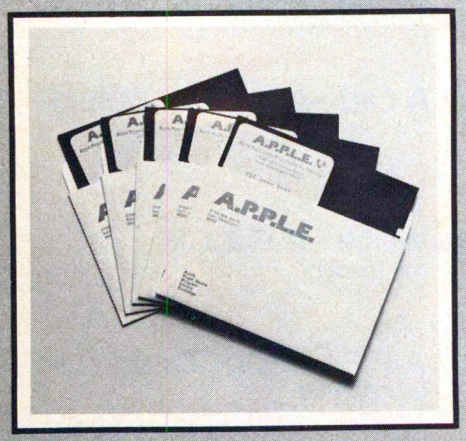

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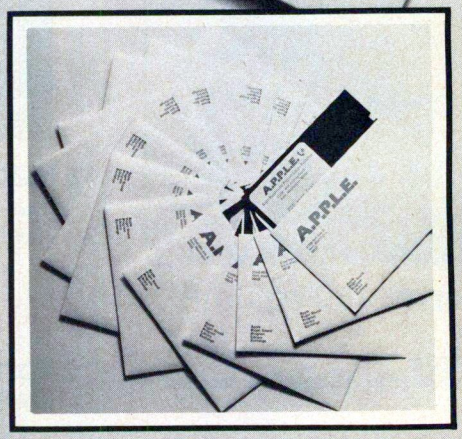

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THE EDITOR BYTES BACK

the editor

MANY times we have wandered through reference material such as page 138 of the Applesoft Basic Programming Reference Manual, looking at the names for some of the ASCII control character codes, names such as ETX or NAK, but it took reading **Cecil Fretwell's Telecommunications Protocol Primer** to give us a clue as to the actual significance of those names. Cecil (bet you thought he could only write about ProDOS and the IIe) really has put together a document here to explain just what protocol is all about and how it's used.

How many of you own a modem? That's what this issue is about. Surely if you do, you've checked into one of the many bulletin board systems around the country, such as our own A.P.P.L.E. Crate. Maybe while you were on, something happened that shouldn't have, and you tossed a handy epithet back at the SYSOP for running a lousy system. **Philip Chien** is with us to tell what running a bulletin board is really like, and **ABC's of ABBS's** shows it ain't all peaches and cream.

We'd like to welcome **A is for Apple** and **Ralph Swerdlow** back to our pages. Take a gander at what Ralph has cooking to keep your private messages private in **Telecommunications Security.**

Educators and non-educators alike, one feature you may not want to miss is **Infra-Red Remote Controls in the Classroom. Bob Zimmerer** describes a simple and inexpensive hardware project that allows an Apple to be used as a multi-input device.

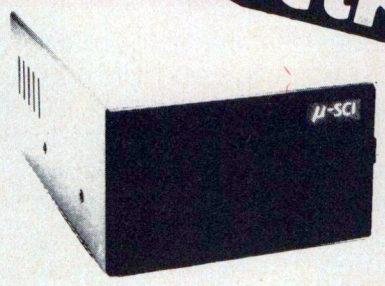
Late January was when Apple's new Macintosh was introduced and **Randy Wigginton** came up from Cupertino to give us some first hand information. You can read about it in the photo story: **MacTuesday.** You will find additional Macintosh coverage in **Tomorrow's Apple's Today,** and we would like to urge everyone to read our editorial It represents our strong viewpoint on an unfortunate set of circumstances we are powerless to control.

We suggest also the second edition of **A.P.P.L.E. Bits & Pieces: Member Billboard** for some interesting reading. If you're puzzled about some of the changes you see in your club and your magazine, then we suspect this is your meat. Note also if you have questions or comments on club operations, this is your forum . . . we'll tackle them as we get them.

Neither last (but almost!) nor least, we'd like to remind you there is a $100 credit for club products waiting for some lucky member. All you need to do is complete the reader's choice card in this issue and mail it in. Winners are drawn each month at our regular membership meetings.

A peek at our re-redesigned contents page should fill you in on what we've missed here, and that's just a whole big bunch of stuff.

Laing Electronics



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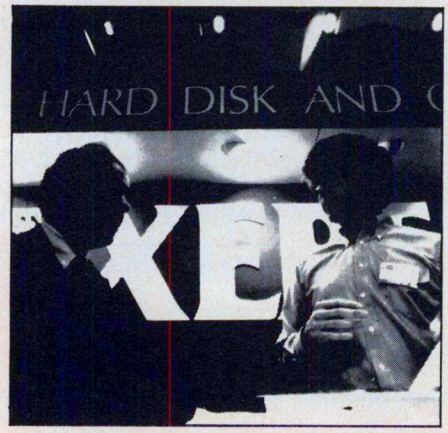

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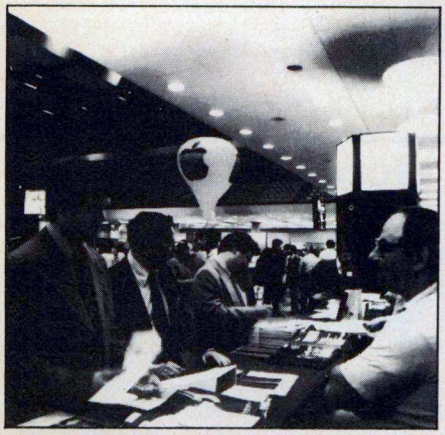

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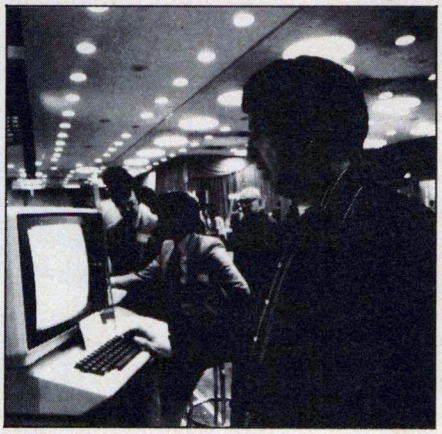

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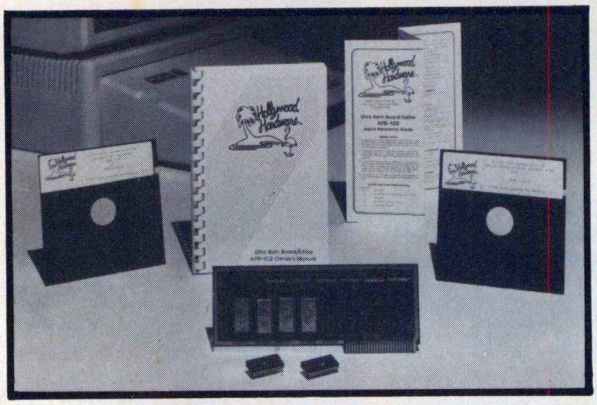

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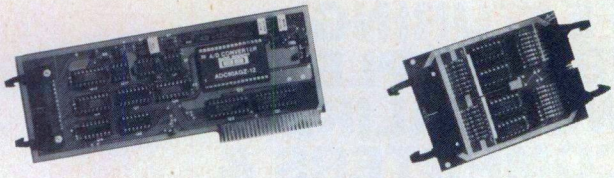

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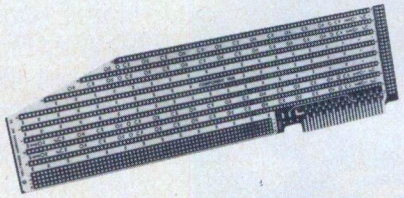

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val j golding

LET'S start March off with our special for the month — a three way super-special. Elsewhere in this issue, you will find the results of our **Eamon Adventure** contest of a year or so ago. From the contest we have acquired 13 new Eamon diskettes to add to our public domain collection. There are now a total of 45 Eamon Adventures, number 0 through 44, inclusive.

We spent some time thinking about the best way to make the new adventures, as well as the total collection available to our members at considerable savings. Here is what we came up with: If you want just the five prize-winners, you can order SEASP1 for $22.50 and save 9%. This is **Eamon Special 1.** You can save 15% if you order all 13 new adventures for $55 (order code SEASP2) and get **Eamon Special 2.** Lastly, you can really shoot the works and get the entire 45 diskette Eamon set for $175. That's $50 off the regular price, or about 22%. Use order code SEASP3 for the **Eamon [super] Special 3.**

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We have introductory prices which expire at the end of this month (that's probably about a week from now) on our two new ProDOS products, **ProZAP** and **Apmail.Pro.** Here is the information you need to order:

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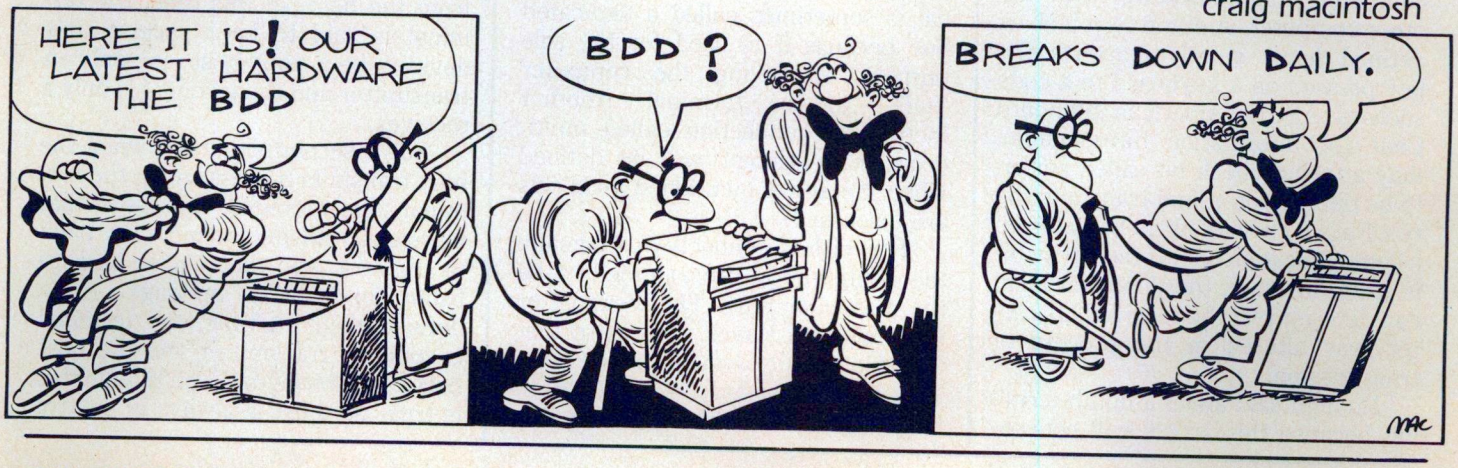
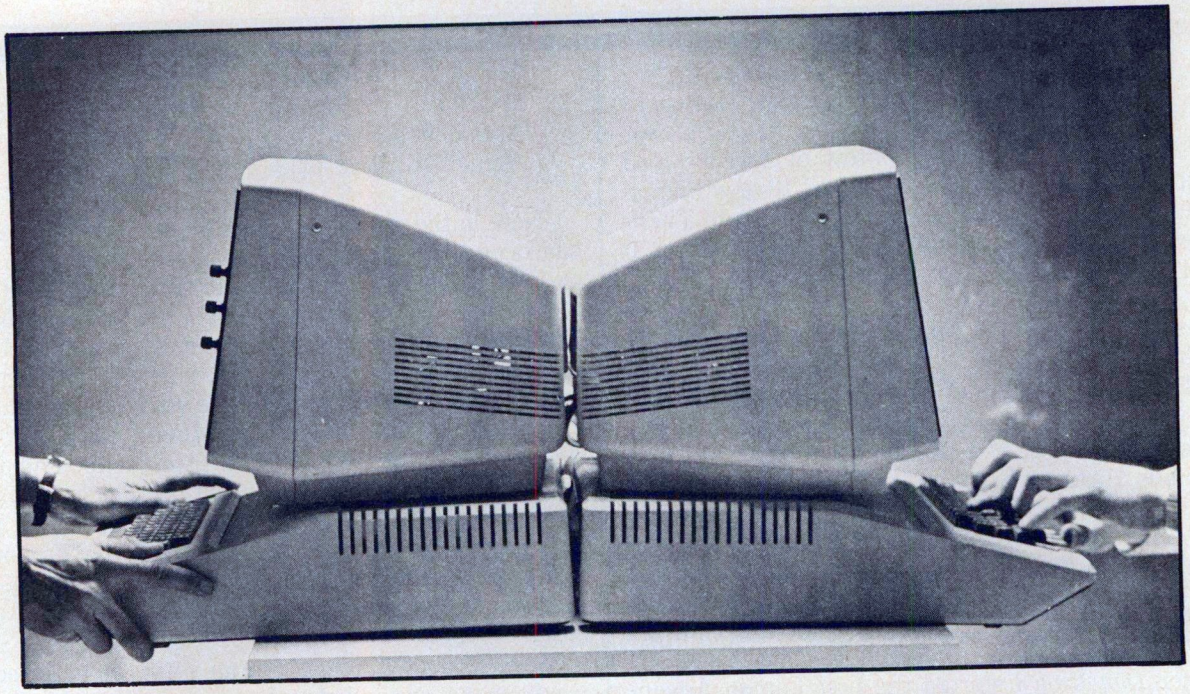
Sometimes we do not have an opportunity to see new products that are added to the catalog. This was the case with the Panasonic printer. (What, you thought they only made TV's? {you're not alone}.) Anyway, to make a short story shorter, we had some graphic repro to run off for a future issue of the magazine, so we hied off to the member store, where we knew one was set up. Were we ever surprised! For a $325 printer, it really had everything. With a new ribbon on it, our graphics printout was sharp and contrasty. The print speed ranges from 80 to 96 CPS, and each pin of the nine-pin print head is addressable, plus it can handle sheet fed or tractor fed paper. Our next project is to talk Dick into one for our machine. But what is more important, you can save $174 off the manufacturer's suggested retail of $499. The product code is HPANPR. For serial applications, a serial adapter is available at $85, product code HSERIN.

Boot

craig macintosh



A Telecommunications Protocol Primer



cecil fretwell

THE purpose of this discussion is to provide a neophyte with enough knowledge to be dangerous or to enhance a more experienced person's knowledge with regard to the subject of data transmission and protocols. After an introduction to the general schemes of data transmission, a brief discussion of a Burroughs protocol and the IBM Binary Synchronous Communications protocol will be presented.

Data transmission ranges from one dumb terminal communicating with another dumb terminal up to a computer communicating with another computer. A dumb terminal, as defined here, merely converts the key pressed on a keyboard to a code such as ASCII (American Standard Code for Information Interchange), may attach a check bit called parity, to be defined later, and transmits the resulting eight bits as a character on a communication line. If the parity bit is used, at most, the dumb terminal can determine if the received character was altered in the process of transmission.

Enough said about a dumb terminal because this article will concentrate on data transmissions between a computer and an intelligent terminal, hereafter referred to as the terminal. An intelligent terminal could itself be another computer or a sophisticated CRT. Since modern CRTs almost exclusively use microprocessors, a sophisticated CRT may be regarded as another computer.

The simplest connection between a computer and a terminal is called point to point. A simple diagram for this connection is shown in Figure 1.

For point to point, the connection between the computer and the terminal is sometimes called a dedicated line because it is used for the sole purpose of having the computer "talk" to the terminal. Another method of connection called multidrop or multipoint will be defined when the above mentioned protocols are discussed.

For either connection, normally the computer is programmed to be the master or host. The terminal or terminals are slaves in a sense that they are "totally owned" by the host. This is not always true; however, to maintain a reasonable scope for this article, only the host–slave aspect will be covered. Hereafter, the slave will always be called the terminal.

First, concentrating on point to point, assume the terminal is initialized to wait for something to be sent to it by the host. Under these conditions, the terminal is said to be in receive mode or is simply called a receiver. The host is said to be in transmit mode or is called a transmitter. The terminal could be said to be "listening" for a message.

For a first situation, when the terminal receives a message, it processes that message, then cycles back to listen for another message from the host. In this case, the terminal is said to be a receive only device, i.e., the host is only a transmitter and the terminal is only a receiver.

For a second situation, when the host transmits a message to the terminal, the terminal processes that message, transmits a message back to the host, and then cycles back to listen for another message. At a defined point in time, the terminal becomes a transmitter and the host becomes a receiver. Even though this is true, the host is always in control

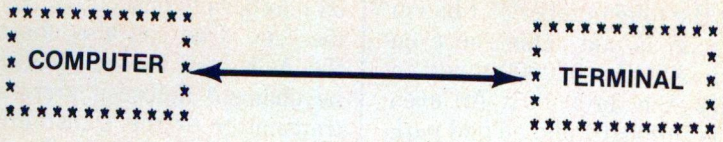


Figure 1. Simple Point to Point

because at the end of the process, the terminal always returns to the listen or receive mode. Thus, the terminal "speaks only when spoken to".

Finally, consider the more complex situation where the terminal wants to talk to the host. There are a variety of ways in which this can be accomplished. Applying the KISS formula (Keep It Simple, Stupid) and remembering that the host is always in control, a message to the terminal could include a control character or characters at the beginning of the message. If the control character indicates a message to the terminal, the connection could proceed as described in the previous paragraphs. In this case, the host is said to SELECT the teminal.

If the control character(s) does not indicate a message to the terminal, it could be asking the question "terminal, do you have a message for me? " In this case, the host is said to POLL the terminal. If the answer is yes, the terminal temporarily becomes the host and the connection proceeds as described earlier with the exception that at the end, the terminal reverts back to listen mode and the host is again in control.

If the answer is no, the terminal would merely respond with a prescribed "no message" and revert back to listen mode. This last possibility requires that the host periodically POLL the terminal because under the restrictions of KISS, the terminal can not arbitrarily talk to the host. The host could run for a long period of time without selecting the terminal, therefore, it must occasionally POLL the terminal.

The three situations given above by no means imply that these are the only types of point to point connections. At most, three broad categories are represented, under each of which exist several variations.

The described situations greatly enhance the definition of the word protocol when used in conjunction with computers. First of all, from Webster's New Collegiate Dictionary, one definition of a protocol is "a code prescribing strict adherence to correct etiquette and precedence." Even though Webster further adds to this definition the words "(as in diplomatic exchange and in military services)," the definition broadly applies to a computer protocol. Each of the examples show that precedence exists in the sense that the host is always in control and has rank, position, or privilege. In the context of this article, etiquette refers to the precise rules to be followed by both sides in the order given in the examples and the discussion to follow.

Now to be more specific and to enhance the definition of a protocol, one would ask "What is a message?" A smart aleck answer would be anything one wants it to be or "whatever turns you on." One could agree that the protocol requires every message to be of the same length, e.g., 80 characters. This would allow a message of say 60 characters with the requirement that the message transmitted be padded with 20 spaces to conform to the 80 character rule. If one message is to contain say 81 characters, then it must be broken into two messages. The first being 80 characters and the second being one character followed by 79 spaces. This scheme is sometimes used; however, it wastes time and space and, therefore, is not efficient.

The common method of transmitting a message is to allow a variable number of characters in the message. In this scheme, the last character in each message will be a special character called[1] the End of Text character or ETX for short. When the receiver, say the terminal, "sees" the ETX character, it knows no more characters follow for that message and proceeds accordingly. As the discussion of the Burroughs and IBM protocols will show, other special characters are usually added to the beginning and end of a message.

Obviously, according to the above definition of a variable length message, the body of the message can not contain the ETX character. If such were the case, the message would be

[1]Special characters such as ETX are transmitted as control characters and are defined in Appendix K, on page 38 of the *Applesoft Basic Programming Reference Manual.*

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prematurely terminated by the receiver. In the majority of cases, the ETX character can be chosen to avoid this situation. The discussion of the IBM protocol will show a method of including the ETX and other control characters in the message.

In the examples, if Murphy's First Law (Anything that can go wrong, will go wrong) did not apply, then no further discussion would be required. Therefore, consider the question "how does, for example, the terminal know that the contents of a message from the host are correct, i.e., did an error occur?" Whether the computer is feet or miles from the terminal, the host could send the word MISTAKE and the terminal could receive the word MISTEKE. The number of characters in the message did not change, however, in this example, the character A had a bit changed from a 0 to a 1 making it look like the character E at the terminal end.

In order to detect this possibility, the method used for the ASCII code set will be described. In the ASCII code set, every character contains 8 binary bits (0 or 1). Seven of the bits are used to define a character which allows for 128 possible characters. For example, an ASCII A is 1000001. The eighth bit is called the parity bit. A character set can use either even or odd parity.

For even parity, the parity bit in the 8 bit character is chosen such that the total number of 1 bits in the character is even. For odd parity, the parity bit in the 8 bit character is chosen such that the total number of 1 bits in the character is odd. Thus, an even parity A in ASCII is 01000001 and an odd parity A is 11000001. An even parity E is 11000101 and an odd parity E is 01000101.

Now returning to the example of an A changed to an E, using even parity, the host transmits 01000001 and, because of an error on the communication line, the terminal receives 01000101. The received character does not have an even number of 1 bits, therefore, the terminal knows an error occurred. Since it does not know what was changed, the example protocol needs to be modified in the following manner.

When the transmitter sends a message, it will always expect a response message from the receiver. If the receiver detects no error, it sends a positive response message, called an ACK, to the transmitter and both systems proceed to the next step in the protocol. If the receiver detects an error or errors, it sends a negative response message, called a NAK, to the transmitter. The transmitter then sends the message again and waits for a response from the receiver. The next step of the protocol is not performed until the receiver provides a positive response or an alternate action is taken.

Obviously, under extremely bad conditions, the receiver could always detect an error and constantly NAK the transmitter. Usual practice is to abort the connection after a prescribed number of consecutive NAKs to a message. One can also observe that the ACK sent by the receiver could be changed before it arrives at the transmitter or the transmitter ETX could be changed such that the receiver could not detect the end of a message. The discussion of the Burroughs protocol will indicate how the connection can recover from this error.

Using parity, one could be led to assume that no further error checking is required. Such is not the case. Consider the example shown in Figure 2 using even parity.

TRANSMITTER	RECEIVER
01000001 A	01000001 A
01000010 B	01001011 K
11000011 C	11000011 C
00000011 ETX	00000011 ETX

Figure 2. Message with Parity

Note that the B was changed to a K. The received K has even parity, therefore, the receiver will not detect an error under the current protocol of operation.

The concept of a Longitudinal Redundancy Check, LRC, must now be introduced into the protocol. The LRC is a character which is added to the message and normally follows the ETX character. Stated in theory, the LRC character is the half added sum of all of the characters in the message down to and including the ETX char-

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acter. For the more knowledgeable person, this is performed using the Boolean exclusive OR concept.

In order to more practically describe an LRC, consider the modified example shown in Figure 3.

TRANSMITTER	RECEIVER
01000001 A	01000001 A
01000010 B	01001011 K
11000011 C	11000011 C
00000011 ETX	00000011 ETC
11000011 LRC	11001010 LRC

Figure 3. Message with Parity and LRC

As the transmitter sends out the message, it computes the LRC based on the contents of the message down to and including the ETX and sends the resulting LRC immediately following the ETX. In this example, the LRC happens to be the character C. As the receiver receives the message, it also computes an LRC based on the contents of the message down to and including the ETX. In this example, the LRC happens to be the character J. If no character has a parity error and if the LRC received from the transmitter agrees with the receiver calculated LRC, then it is assumed the message was received correctly. In the example, the transmitter's LRC does not agree with the receiver's computed LRC, therefore, even though no parity error occurred, the message is in error.

After some close study, the reader will note that the LRC is really a method of providing longitudinal or vertical parity. In other words, for either type of parity, the LRC character is chosen such that for the total message, including the LRC, there are an even number of 1 bits in each column, i.e., bit position.

The combination of using parity on each character and including an LRC character results in a very reliable error checking scheme which is one of the industry standards. One could argue that bits could be changed without affecting the parity of any character and without affecting the LRC combination, however, this would mean that at least two characters would have bits change in precisely the same positions and in precisely the same manner without affecting parity or the LRC character. Experience shows that the odds of this happening are extremely slim because errors occur in a random fashion.

Having gained enough knowledge via a point to point connection, it is now possible to discuss some more sophisticated protocols. At this point, the multidrop method of connection will be introduced. A simple diagram for this connection is shown in Figure 4.

For multidrop, on a single communications line from the host, one or more terminals are connected into this line in parallel or party line fashion.

When compared to point to point, protocols for multidrop systems are more complicated. For example, if the host has a message for Terminal 11, some rules must be prescribed whereby Terminals 10 and 12 ignore that message. As in point to point, all terminals are listening on the line and capable of receiving or transmitting messages.

Rather than attempt to describe multidrop in general terms, it is more practical to consider the major features of actual protocols. The first to be considered will be the protocol used by Burroughs to communicate with, among other things, their TD830 CRT terminals. The author has modified a Televideo 950 CRT to provide a low cost replacement for the TD830.

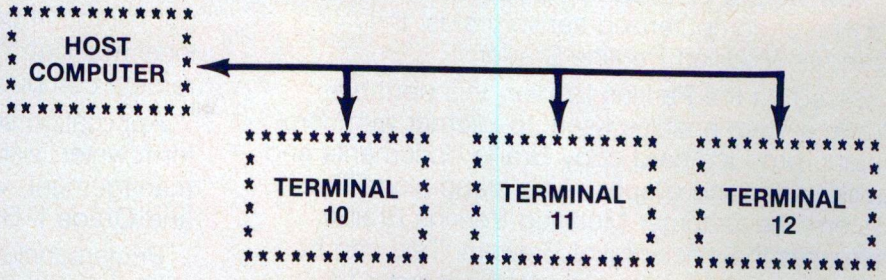

Figure 4. Multidrop Connection

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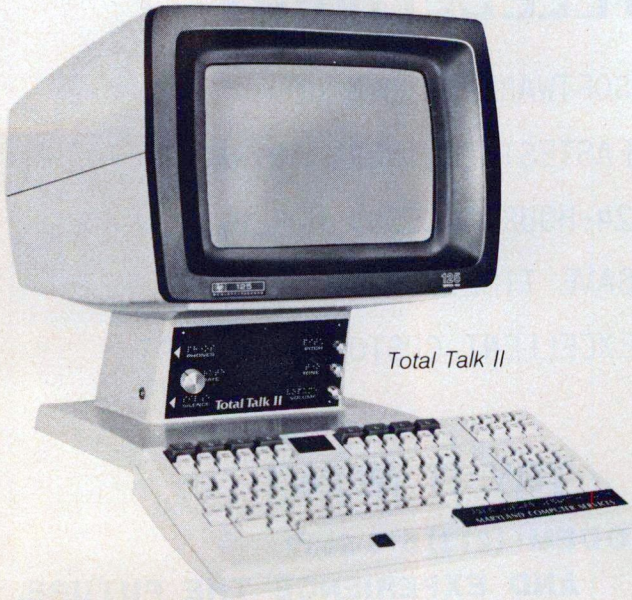
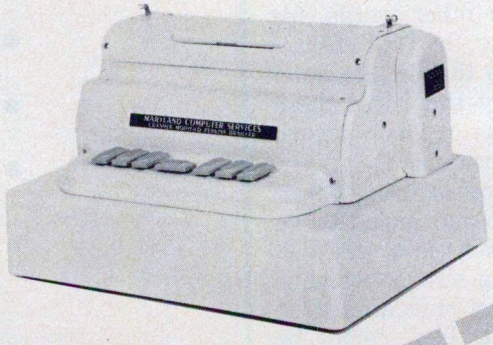


Total Talk II



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This discussion will not be in depth in the sense that all features of the protocol will be described. The normal code used by Burroughs is the ASCII code set.

For Burroughs, two major features will be described. These are (1) NORMAL SELECT and (2) POLL. A SELECT means that the host wishes to select a designated terminal and attempt to send a message to that terminal. A POLL means that the host selects a terminal and determines if the terminal has a message to send to the host.

For a NORMAL SELECT, the sequence of events is summarized in Figure 5.

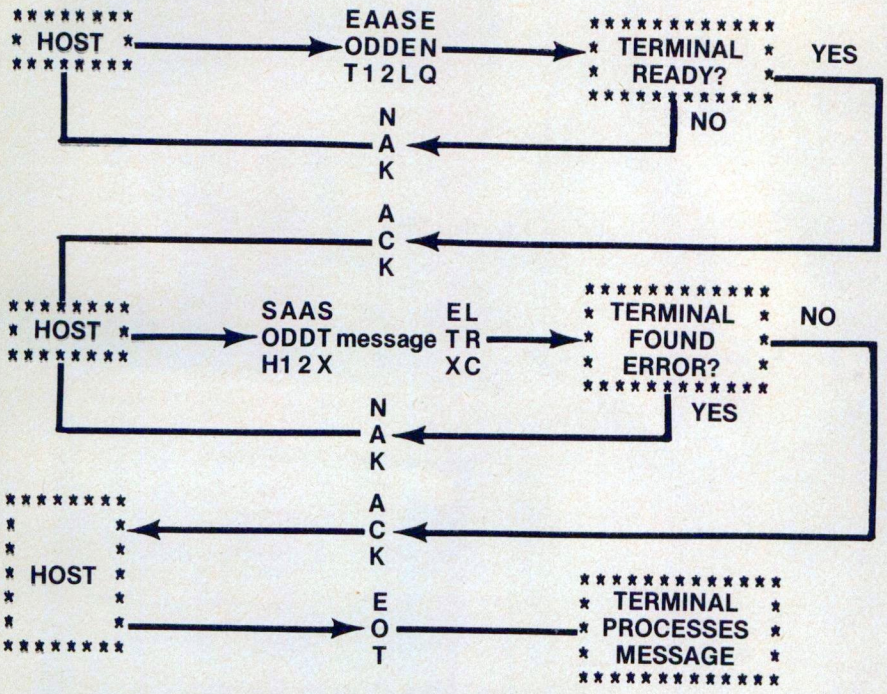

Figure 5. Burroughs NORMAL SELECT

In this diagram and in the initial discussion to follow, some details have been omitted. These details include procedures to follow under abnormal conditions and will be discussed after a general discussion of NORMAL SELECT.

Before the host issues a POLL or a SELECT, all terminals are listening on the line, i.e., they are in receive mode. When the host wishes to select a terminal it transmits the sequence EOT, AD1, AD2, SEL, ENQ. This is called the SELECT sequence.

When each terminal sees the EOT, no matter what state it is in, it clears its logic to look for a control sequence such as a SELECT. In an earlier paragraph, it was mentioned that an ETX that was altered would cause a terminal to miss the end of a message. If a terminal is in this state, EOT will cause it to abort and reset its logic back to a known state.

The AD1, AD2 characters following the EOT are called address characters. They determine which terminal is desired, therefore, each terminal looks at these characters. If the AD1, AD2 from the host is not the AD1, AD2 programmed into a terminal, then that terminal ignores all future characters until it sees an EOT. Using the above figure, if AD1, AD2 are the characters 1, 1 then Terminals 10 and 12 are "disconnected" from the line and Terminal 11 is "connected point to point" to the host.

Terminal 11 now looks at the next two characters. In the SELECT mode, these two characters will be the SELECT character, SEL, followed by the Enquiry character, ENQ. Terminal 11 now knows the host has a message to transmit.

At this point, Terminal 11 may be in one of two states. For the first state, it could be processing a previous message, in which case, it is not available to receive a message from the host. It indicates this fact to the host by sending the NAK response. The host regards the terminal as busy, retains the message for the terminal, and will attempt to send the message again at a later time. For example, the host could process information for the other terminals on the line and then attempt to SELECT Terminal 11 again.

For the second state, the terminal could be idle, i.e., ready to receive a message from the host. It indicates this fact by sending an ACK to the host.

The host now sends SOH, AD1, AD2, etc. to the terminal. When the terminal sees the SOH, it resets its LRC then receives characters and computes an LRC until it sees an ETX, which is included in the LRC calculation. If the LRC it calculates agrees with the LRC from the host and if no character in the message had a parity error, then it sends ACK to the host, the host responds with an EOT, the terminal proceeds to process the message, and the host pro-

cont'd on p. 62

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Circle 11 on Reader Service Card

MacTuesday

dave redhed/ val j golding

STANDING room only, festive balloons brushing the ceiling (later to set off burglar alarms in the dead of night), throngs of the curious wending their way through the double glass entrance doors at A.P.P.L.E. — this was the scene the Tuesday Mac came to town.

Notices had been mailed to members, messages placed on the A.P.P.L.E. Crate bulletin board, suspense had been mounting for days and weeks (perhaps even months for those who paid heed to the early Mac rumors). By the time the eve of Tuesday, January 24th finally rolled around, the curiosity had reached a frenzied peak. It may well be you will remember that rainy eve from here on out as *MacTuesday,* the day Mac-

26
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intosh was officially introduced.

As members and guests of the world's largest Apple Computer group filed in, they were greeted by **Patti Hoffman** at the new member enrollment desk where they were offered a free ticket for a drawing on a Panasonic printer. On their right they passed by the (later to be mobbed) member's general store, then to the meeting room.

. . . a Panasonic printer was the prize.

Earlier, **Randy "two G's" Wigginton** arrived from the airport, along with his assistant **Ed Ruder** and two (count them, two) Macintoshs. Randy was one of the very first programmers to go to work for Apple and played a major role in the development of Applesoft II and DOS. He now works exclusively as a consultant to Apple Computer and is the author of *MacWrite,* the word processor program that comes with Macintosh.

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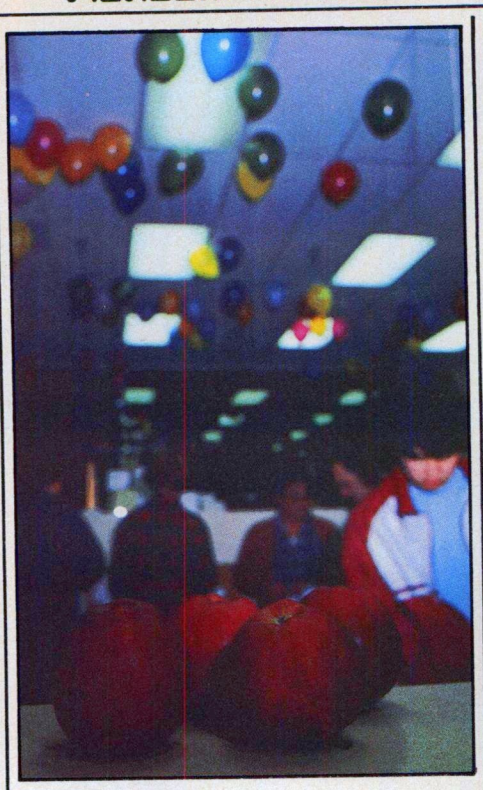


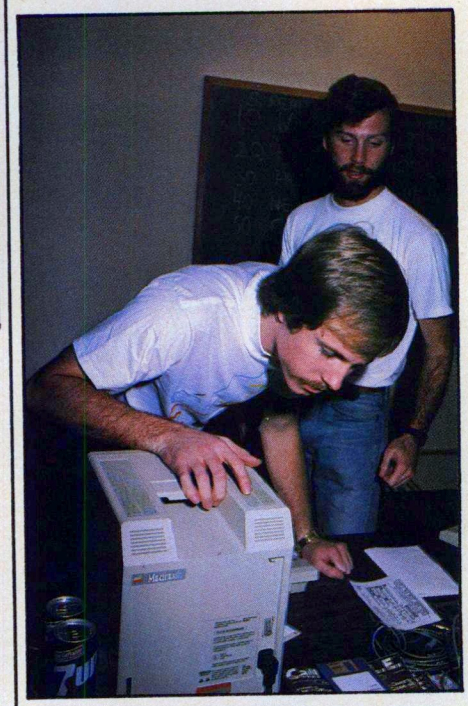
A hurried consultation between Randy and Ed, and **Dick Hubert** and **Charlie Stillman** of A.P.P.L.E. concluded that it would be best to set up Randy and one Mac in the auditorium, and Ed and the other Mac in the conference room to handle the overflow. Charlie then scribbled out a bunch of "take a number" tickets so that all comers would have an opportunity to see Mac in action.

. . . all would have an opportunity to see Mac.

. . . and action it was. With front and rear doors open to exhaust the heat of the crowd in the meeting room, even the outside temperature of 42 or 43 degrees was not sufficient to fully cool the building. However, the 350 or so attendees seemed not to mind as all thoughts turned to the easy-to-use and innovative features of the Macintosh.

Randy took the rostrum and demo'd MacWrite and all of its finer points. There was not a sound to be heard as Mac came to life and the clarity of its display became evident.

Even from a distance, one of the most impressive points about Mac was its ultra-high resolution screen, captured perfectly on video cassette by secretary **Dave Lingwood** who manned the cameras for this occasion. Mac in fact has *only* a high-res screen; there is no text screen as we know it. Mac is certainly fast and efficient, and as software becomes available, should be able to run circles around its competition, mouse or non-mouse. For those pining for more detail, elsewhere in this article, **Dave Redhed** presents his technical overview of Macintosh.



Thanks, Randy and Ed. . .

As with all things, MacEvening came to an end, Randy packed up his precious cargo just as quickly as it had earlier been assembled in minutes, and was escorted to the airport. No printed words of thanks can be sufficient to convey the club's gratitude to Randy and Ed, who gave up a day of festivities in Cupertino at the Apple stockholder's meeting and introduction to Macintosh and Lisa 2. Having delivered his product (MacWrite) to Apple on schedule after weeks of 28-hour days, Randy is now off to incommunicadoland. Have a good one, Randy.

MacTuesday had come to an end, and the Apple world was richer.

. . . Val J. Golding

Continued P. 24

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ABC's of ABBS's

philip chien

MORE people than ever are getting modems for their computers now. Considering that a bare-bones Vic-20 and modem can cost under $200, it is not surprising that there are massive numbers of people using their dumb terminals and micros to communicate with other computer users. Some of this communication is on large databases, like university computers, Delphi, Compuserve, the Source, and even MCI's tele-mail, but many people, after finding out the cost involved in using those systems, are turning to micro-computer BBS's as an alternative.

The BBS's have much less memory (usually about 48K RAM, 240K disk space online). With one phone line connection, only one user can be online at a time. The only user a person online can chat with is the owner of the system. Balancing out all of the disadvantages, the price is right, as most systems are free to use. Usually the only thing the user pays for is the phone call. There are other advantages to small BBS's. On my own system, I have NASA's space shuttle manifests online. I've seen no other system, mainframe or micro, which has these listings. (Okay, I'll admit that NASA's mainframes have the shuttle listings online, but their systems aren't open to the public, and this article is about public BBS's.) Top that Source! Local BBS's also have items like discount hardware deals, dating sections, and other "items of interest" to the end user.

You may be thinking about running a bulletin board system and you're asking yourself operation questions. (If so, you should talk to a good psychiatrist and explain why you're asking yourself questions. If on the other hand you're trying to find answers, then here they are.)

Question

What does it take to run a BBS?

It takes a lot of hard work to run a BBS.

Answer

First you must have an appropriate computer and software. A good minimum is: An Apple II with 48K RAM, at least two disk drives, an auto-answer modem, and some commercial BBS software package. A fan to cool down the computer is a must, because your Apple will be on 24 hours a day. You'll also need another separate phone line for the computer; you *do not* want to use your normal phone line for your BBS.

Highly desirable, although not absolutely necessary, are a clock card, printer, word processor which can edit the BBS's text files, a power line surge protector, and either a lot of computer experience yourself, or a good friend (read: computer consultant who will donate his/her services for free) to modify your system as needed. One of the more unusual prerequisites for running a BBS is the ability to communicate with others. Not necessarily riting/speling skils (How many programmers and/or computer users do you know who can spel?) It doesn't hurt if you know how to spell, or how to write short messages effectively, but you will find out, if you run a BBS, that your communicating skills will increase out of necessity.

Question

What about the wear and tear on my system?

Answer

What wear and tear? Seriously though, solid state devices, such as the Apple, work better when left on 24 hours a day. You actually increase the life of your machine with continuous operation. Each time you turn your Apple on and off, you send a microscopic power surge to the ICs; when you add all of the microscopic surges together, it's quite likely that you'll "burn out" some IC; (the most probable time for a non-mechanical electronic part to fail is when the power cycle changes). Even more likely, you'll break the power switch. Leaving your Apple on eliminates these problems. You may actually save enough money in repair bills which you would have paid for broken power switches, burnt out ICs,

etc., to pay for the Apple's power bill. As long as your Apple isn't overloaded (too many high power cards without a fan) keeping the power on won't harm your Apple. However — don't forget to shut off the Apple before inserting or removing any cards. Removing or inserting cards with the power on decreases the life of your Apple — *drastically!!*

As far as wear and tear with everything else in your system, expect to replace your diskettes on a monthly basis (they'll be written to and read from much more often than any other diskettes you'll own). Expect to eventually replace your disk drive mechanisms (since they're mechanical mechanisms, they *will* eventually fail.) If you use your disk drives on a 24 hour basis, then the MTF (Mean Time to Failure — the average time until the mechanical parts fail) is about eight months of continuous use. You won't have to worry about wear on your monitor (or television's) tube; simply turn off the monitor after you start running the program.

Another factor you may have forgotten to take into consideration is wear and tear on yourself. If you have your system in your bedroom, you may not be able to sleep while your system is running. You'll have disk drives re-calibrating, beeps from the speaker, and depending on your system, possibly a hard drive running, or a printer printing. You may need a separate room to put the bulletin board in.

Question

How much does it cost to run a BBS?

Answer

Beyond the cost of the hardware, and software; here's a breakdown of the approximate cost of running a system each month:

•Phone line (will vary depending on where you are in the country)	$10
•Electricity (ditto – about 100 watts)	$30
•Maintenence (approximately, this includes diskettes, cleaning the drives, extra phone calls, etc.)	$35
Total:	$75

You may be tempted to recoup the costs of running your system via membership fees, but I don't recommend this. Since you cannot control where your calls come from, your BBS will technically be a business under the control of the Interstate Commerce Commission, FCC, Interstate phone regulations, etc., as well as any local business laws.

There are, however, two ways around this problem.

1. Provide a service, through your business which you charge your "customers" for, and use the BBS as part of your service to your customers. (*Call -A.P.P.L.E.* does this. Anybody who is a member of A.P.P.L.E. can access the Call -A.P.P.L.E. sections of the Source, and the Call -A.P.P.L.E. BBS, but there is no separate charge for access privilege to the BBS.)

2. Provide a mail order buying service (blank diskettes, computer supplies, computer equipment, pantyhose and anything else you want) on your BBS, and encourage your users to use it, explaining that the profits from the buying service will be used to run the board.

Assuming you've still decided that you want to run a system, you'll have to spend about an hour a day working on the files, answering mail, deleting old information, checking out new users, etc.

Now that you've decided to run a system, you've bought the hardware and software, set it up and got it running. Now what do you do?

1. Decide what direction you want your board to take. Do you want it to be a dating board, a place for experienced users to exchange information, an advertisement for your business, a local "supermarket bulletin board," or a place to meet people with your specific hobby?

Do you want specific topics to be emphasized on your board (e.g., in my area there are boards with specific "DOCTOR WHO," "COMICS," "VIDEO TAPE," "NUCLEAR WAR," "TRIVIA," and other topics)?

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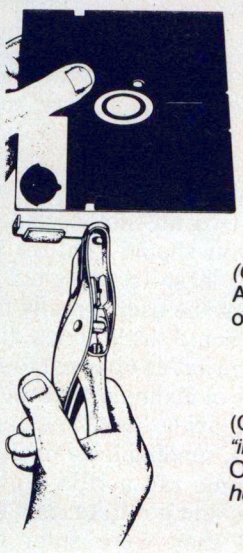

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What direction your system will take, and what your particular hobbies or interests are will help you decide on a name for your system. An inside joke like "The GHOTI System" might be nice, but won't tell potential users what your system does, or is for. Using the default name which comes with your software package shows no imagination whatsoever.

2. Advertise your board on other local boards. Give the name of your board, your name, the board's phone number, the board's location (it is not trivial, people will want to find out what it's going to cost to call you up!), operating hours, and what your board's specific interests are. If you don't tell people reading your ads what specific interests your board caters to, the readers of your ads won't be interested. See examples below:

Bad:

```
******************************
*     I've got a great bulletin *
* board in New Jersey. The     *
* phone number is 201-555-     *
* 2368. I've got seven different *
* download, hints, and help sec- *
* tions. There's online games, *
* message bases, and a private *
* E-mail section. Call today!!! *
******************************
```

Good:

Call "The Darkover Message system." We're located in Little Falls, NJ and the phone number is 201-555-7429. Besides Darkover, our discussion topics include D&D, Fantasy, and an online Dungeons and Dragons game. The board is up 24 hours a day, and runs on an Apple. SYSOP: A. Hopkins

The bad ad looks nice, but doesn't tell anything. A phone freak can tell, from the area code, that the board is in northern New Jersey; but that means that the call can be anything from a local phone call to a very expensive long distance phone call if the end user lives in New Jersey. Although the board states that there are seven download sections, it gives the reader no idea what is in those sections. The good ad tells the reader alot about the system. Even if the viewer never read any of Marion Zimmer Bradley's books, he/she still gets a good idea of what the system is about.

3. You may also wish to put an ad on mainframes (like the Source, Compuserve, etc.) and inform various magazines which list bulletin boards. If you do advertise through these methods, you'll get a lot more callers. You must decide whether or not you want that many users.
4. Wait for the calls to come in.

When a user calls, he/she should be required to leave a phone number where he/she can be reached to confirm his/her existence. You should call each caller (one of the reasons that I'm allowing $35 for maintenance is for the phone bill to confirm callers). If you need to keep down your phone bill, you may wish to make collect calls to verify your users. If you must do this, then:

a. State that you make collect person-to-person calls to verify the users. (Nobody likes to be surprised with a collect call),
b. Attach your phone to the computer line when you make the call. If you just dial the collect call normally, then you'll be giving out your voice phone number to your users (all phone bills state what number collect calls were made from).

If you have an adult or X-rated section (the two are not necessarily the same), you should confirm that the user is at least 18 years old and whether or not the user is really male or female. Some little boys (little meaning maturity, as opposed to size) get kicks out of claiming that they're female, and leaving "hot" messages, making dates, sending lewd mail, etc. Friends of mine ran a BBS with an adult section, and got irate calls from parents that they were smut merchants, and their kids were using the board as a bathroom wall. (For some reason these parents thought that the fault laid with my friends, as opposed to the way they raised their kids, but that's besides the point).

If you allow people to have aliases on your board, then you should keep their real name on file offline. Don't forget that when you run a BBS you have certain responsibilities and obligations. Treat your userlists (with the phone numbers and real names) with the same respect that you would treat any other phone book. You wouldn't give out somebody's phone number to another person, without getting the owner's permission, you shouldn't give out the phone numbers of anybody on your system. Also, you should respect the privacy of your user's private mail boxes. You wouldn't (or at least shouldn't) read you're roommate's or somebody in your building's mail; you shouldn't eavesdrop on your user's mail. *Even if the person you want to date is writing another user on the system and agreeing to go out with that person instead of you!!* The only reason you should *ever* access another user's mail is either:

a. If that user tells you that there is a problem with the file and asks you to fix it or delete it.
b. To delete mail that has been left on the system for more than two months without being read. If you don't delete old mail, your disks will be filled with letters which will never be read.
c. If the mail is misaddressed, you may need to read it to determine which user is supposed to get the mail.

After you've gotten a fair number of callers and see which directions your board is going, you should decide on a system policy. This should be online where anybody can read it, and should include such things as:

1. How often must a user call before the mailbox is erased, and the user ID is eliminated. (Usually two months is a good figure, but don't forget that there are many users who access your computer from college, and don't have access to a modem over summer vacation. For those users, you may wish to have them leave you an E-mail message requesting that the ID be kept until they return.) You'll need to delete old IDs because many BBS users call a board once or twice to see what it's like, and if they don't find the board interesting, never call back. Half your user list could be users who you'll never hear from again.

2. The maximum number of users to allow on your system. My favorite board has over six hundred registered users. Fairly impressive, but it usually takes three phone calls before I can get through. You may wish to limit the number of users, in order to make sure that your users can get through easily.
3. A statement should be made that obscene language, fighting, and requests or offers for illegal materials will not be allowed in open bulletins. Granted you have no power to stop such things in private mail, but in the open section such messages should not be permitted. If you do allow them, don't complain when the boom lands on top of you.
4. Users should not be allowed to place phone numbers or addresses in open bulletins. This may sound silly, but if somebody reads those numbers and addresses off your system, and either gives it out to a third party, or sells it to a mailing list company, then it will cause you, and your users, no end of trouble.
5. You'll have to decide whether or not to put a time limit on calls. If you have a lot of users, then you may want to limit calls to an hour or less in order to allow all users a fair chance of getting onto your system. Or you may wish to have a prime time/off system where evenings on weekdays and all day weekends have time limits while the rest of the week unlimited access. Ironically, your prime/off periods will be almost exactly opposite of mainframes. With a system which caters to the business users, like the Source, Prime time is during the business day. For a system which caters to most BBS users (hobbyists, end users, etc.) your prime time is evenings and weekends when people are home. If you don't have a clock, you can simulate a time limit by counting keystrokes, and logging off the user after so-many system functions have been used.
6. Decide on whether or not to have your system up 24 hours a day. Should you decide, due to noise level, to have your system online while you're awake only, it still should be active 24 hours a day. When the BBS is down, the system should answer the phone, print a polite message that the system is down, print information about the system (most of your callers when the system is down will be first time callers and won't know what your operating hours are, what your system is for, etc.) and hang up. If you don't want to keep your computer on when the system is down, then place a phone answering machine online stating that the system is down, and when it will be up again. I highly recommend having the BBS online rather than a voice answering machine. Many modems (specifically the Hayes Micromodem II) don't have the ability to recognize if the system isn't answering the phone or if a voice answers. Those modems detect only whether or not there is a carrier.

One important policy statement should be about fighting. When some dork users call systems they, realizing that they're hiding behind a modem and phoneline, will post rather obnoxious, obscene messages, and pick fights with other users. I've seen Nazis posting anti-Semitic messages, users who attack other users because they have intelligence, etc. These users should be kicked off your system immediately, and permanently. Your statement should say that while a user calls, he/she is a guest in your house, and should act accordingly.

Unfortunatly there are users out there who feel the world owes them everything, that they have a "privilege" to access your system, get the highest security levels, and do anything they desire. These people should be treated the same way as if they came physically into your house and did such obnoxious things, instead of via a phone line.

If you want to place your phone number or address on your system, either in the policy statement, or elsewhere; make sure that the phone number has a 24 hour answering machine (do you want to get calls at 3am complaining "the system's down" or "I can't read the thing-a-ma-bob file"?) and the address is a PO Box (unless you like getting onto mailing

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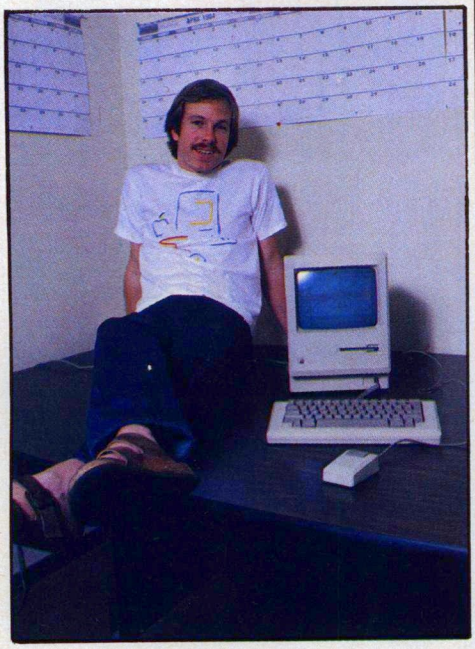
MacTuesday
From P. 18

The guessing and speculation is over now. Macintosh is here and most (but not all) of the questions have been answered. Club members found out quickly that Macintosh is not the dream version of the Apple][that many thought it might be. Especially the hobbyists are a little disappointed because Mac is not a computer you can "fiddle with." But those who consider that there might just be other viable computers than the Apple][found some very impressive features when they looked at Macintosh.

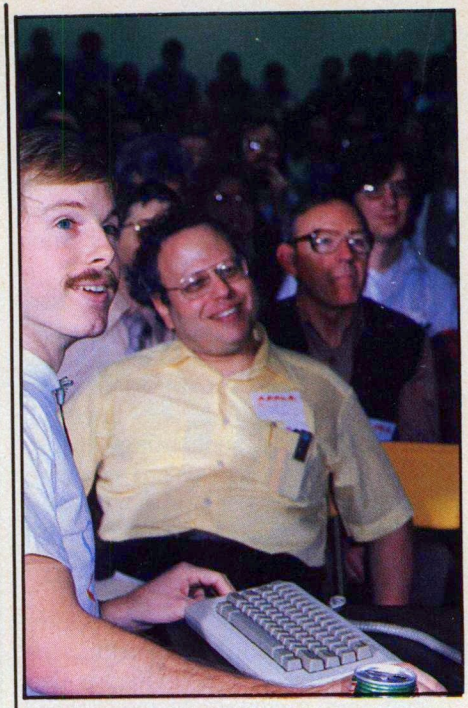
Mac is physically quite small and easy to move around, but it is not like



any of the portables. The CPU is the Motorola 68000 running with an 8 megahertz clock. The built-in monitor is a 9" black and white screen with a resolution of 512 by 342. There is one built-in 400K byte capacity disk drive (3½" Sony). The useable RAM memory of 128K bytes is augmented by a 64K ROM that contains the majority of the operating system and all the graphics software. There are no slots (i.e. the number of slots is zero), but there are two built in high speed, high bandwidth RS422 serial ports. The keyboard is detachable (no numeric pad) and there is a mouse (same breed as with Lisa). At this point in time, that is all there is to the hardware description. Within a year they say that the RAM will be upgraded to 512K, but this is dependent on the availability of 256K chips.

At the time of release, there were apparently just three application programs available; two from Apple (MacPaint and MacWrite) and one from Microsoft (Multi-Plan). The word is that several new applications were to be announced in February and after that they will be appearing at a rapid clip. One projection is that there will be 500 packages available by the end of the year. There were no programming languages available at announcement time, but Microsoft Basic is due out shortly and Apple has an interpretive Pascal coming.

In operation, Mac has to be seen to be believed. The graphics are very fast and with the high resolution screen, the images are extremely sharp. The two packages from Apple do an excellent job of showing off the Mac's capabilities — especially MacPaint. For those familiar with Lisa,



the same general class of user interface is used — icons, windows, and pull-down menus. It is worth anybody's time to sit down and experience what Mac is like; words will never convey what you need to know.

dave redhed

AND THE WINNER.....

An extra added attraction of MacTuesday was the doorprize of a Panasonic printer, model KXP-1090. This beaming young recipient is Christopher Davis, member #15421, of Steilacoom, Washington. Attendees of the MacTuesday meeting were asked at the door to fill out a combination survey and doorprize form, and the crowd was quite pleased to see a youngster win. Congratulations Christopher!

Telecommunications Security

short BASIC programs to encode and decode text files for telecommunicating or mailing

ralph swerdlow/m.d.

OVER the past year or so, many of us have purchased modems and have used them and our Apples to communicate electronically with friends, or to send mail and documents to others. The Source, Compuserve and now MCI mail enable Apple users to send documents to other subscribers' mail boxes where they are stored until reclaimed at some future time.

But how secure is your electronic mail? For one thing, if others know your password, they can access your documents and read them at their leisure. Many of these documents are kept in the data banks of the host computer for many days and perhaps even months, and thus are not really private. First class mail, on the other hand, goes between you and the person who receives your mail without any third party or computer involvement, and, without a warrant, can not be opened, insuring a relatively high degree of privacy and security.

Why not, I thought, write a program that will allow my Apple to encode data, and another program to later decode the data. For a computer, this should not be a very difficult chore.

Once the data was encoded, it would be very simple to send the material using my modem without any great fear that my secrets could be read by anyone. I don't have any great secrets, but the challenge of creating these programs was of sufficient interest to pursue the idea.

Note that while *cipher* is the technically correct word to define a coding process, I have used *cipher* and *code* interchangably here.

As an additional spinoff of my original idea, I realized that a disk containing encoded data could be sent by first class mail and could contain information that would be impossible to read by anyone unless they had the key to decode the material. Also, the same program could be used to "type" messages onto paper and be sent as a letter enabling the recipient to decode it.

My first thought was to use a simple substitution code, in which each letter or character of the original text would be replaced by another character to form the encoded text. This form of code, however, is very easy to decipher and therefore unsatisfactory.

I also wanted the programs to be automatic so that users merely typed in the clear (uncoded) text and the computer not only encodes the material, but saves it on a disk. The recipient, using an agreed upon decoding program, would only need to run the program to decode the text and would have a clear copy. Saving the encoded material as a text file would easily permit the coded text to be sent by modem without fear of its being read by others. Once the material was encoded and saved as a text file on a disk, the disk could be mailed and the text decoded upon receipt.

Let us look at the program:

Line 10 is the classic REMark to identify the program and its source. We are going to encode our text into a string array and must therefore set aside sufficient space to hold the contents of the array. Our Apples will put aside space for eleven strings without being told to do so, but without the "DIM S$(50),S1$(50)" in line 20, we would run out of space after eleven strings were created. Each string S$(N) is capable of being 240 characters in length, so with 50 strings, a document is able to hold

```
10  REM
ENCODE BY RALPH H. SWERDLOW, M.D.

  CALL -A.P.P.L.E. : MARCH 1984

20  DIM S$(50),S1$(50)
30  D$ =  CHR$ (4)
40  TEXT :N = 0
50  HOME
60  N = N + 1
70  PRINT "ENTER STRING # ";N;
80  INPUT " ";S$(N)
90  FOR C = 1 TO  LEN (S$(N))
100 A =  ASC ( MID$ (S$(N),C,1))
110 M = C -  INT (C / 10) * 10
120  IF M = 0 THEN A = A - 1
130  IF M = 1 THEN A = A - 2
140  IF M = 2 THEN A = A - 3
150  IF M = 3 THEN A = A - 4
160  IF M = 4 THEN A = A - 0
170  IF M = 5 THEN A = A - 1
180  IF M = 6 THEN A = A - 2
190  IF M = 7 THEN A = A - 3
200  IF M = 8 THEN A = A - 4
210  IF M = 9 THEN A = A - 0
220 S1$(N) = S1$(N) +  CHR$ (A)
230  NEXT C
240  HTAB 10: PRINT "CONTINUE   Y
     /N.."
250  GET C$
260  IF C$ = "Y" GOTO 60
270  IF C$ <  > "Y" THEN N = N +
     1:S1$(N) = "0"
280  FOR I = 1 TO N
290  PRINT S1$(I)
300  NEXT I
310  PRINT D$;"OPEN CODEFILE"
320  PRINT : PRINT D$;"DELETE COD
     EFILE"
330  PRINT D$;"OPEN CODEFILE"
340  PRINT D$;"WRITE CODEFILE"
350  FOR I = 1 TO N
360  PRINT S1$(I)
370  NEXT
380  PRINT D$;"CLOSE CODEFILE"
390  PRINT : PRINT "ALL ENCODED,S
     IR AND ON THE DISK"
```

12000 characters. This should be more than adequate for most users, but if more space is required, simply increase the size, remembering that your computer does not have an unlimited memory. If most of your documents contain less, space can be saved by reducing the size of the array. Experiment and see what your usual needs are.

Lines 40 and 50 set the screen to its full width, assign N the value of zero and clear the screen. Line 60, of course, adds 1 to the value of N. This is needed because each string we create will be "S$(N)" with N taking values from one up to as high as fifty.

Line 70 prints, "ENTER STRING #" and then N. Note where the semi-colons are located. A semi-colon prevents a line feed so the PRINT statement, N, and the next line will be printed as one line across your computer's screen.

Line 80 asks the user to input a string that will become part of a string array, S$(N), with N increasing by one with each additional entry into the string array. Normally, an "INPUT" command will print a question mark unless there is a statement between the quotation marks preceding the value. In this case, we don't need or want a question mark, so creating a blank statement between the quotation marks eliminates the question mark! The last semi-colon in line 70 insures that the input request and "ENTER STRING #",N, and the INPUT "S$(N)" occur on the same line!

Lines 90 to 230 do the actual encoding of the data. First a value, C, is established to count through the number of letters in the string. Then, in line 100, the ASCII value of each letter in the string is determined. (If, for example, you wished to find the ASCII value of the letter "A," the command "PRINT ASC("A")" — and a return, of course — would produce "65".)

Now the fun begins with the encoding of the string. Once we have the ASCII value of each letter, we could encode that letter by subtracting some fixed value (V) and then print the coded letter by printing CHR$(A-V). This would create a simple code that would be much too easy to crack! What we need is a way of altering the value subtracted in a consistent and reproducible, but unique fashion. The next lines accomplish this task. Let's look at them:

Line 110 determines the modulo 10 of the value of C. To remind those readers who may have forgotten what a modulo is, let us divert for a moment.

For any two numbers, A and B, if A is divided by B, there will be a remainder unless A is an exact multiple of B. Here are some examples:

10/7 = 1 plus a remainder of 3
25/10 = 2 plus a remainder of 5
90/10 = 9 with a remainder of 0
6/10 = 0 plus a remainder of 6
The remainder of A/B is called modulo A/B.

Line 110 determines the modulo of 10/C, and this is the value that we will use to subtract from the ASCII value of the letter described by MID$(S$(N),C,1). By doing this the encoded value of, for example the letter "R," will vary depending where in the string it occurs. This should prove to be sufficiently difficult for anyone to decode unless a great deal of time and effort is spent doing so.

I have selected the value of 10 to be the one that this program uses, but for your own program any value you like may be substituted. You have to change line 110 and the next 10 lines to reflect your choice.

Lines 120 to 210 determine what value to subtract from A. Note that I have elected to use a simple pattern of numbers, with the value ranging from 0 to -4. It is quite important that *a value greater than 4 not be used.* The reason for this may be determined by examining the Table of ASCII screen characters on page 15 of the Apple II Reference Manual.

The lowest characters from the letters we can use is "@" whose ASCII value is 192. Subtracting 5 from 192 = 187. CHR$(187)= the semi-colon, and you will recall if a semi-colon, colon or comma appear within a string, the string is truncated and a message "EXTRA IGNORED" is issued. We do not want this to occur and can prevent it from happening by having 4 the maximum amount subtracted from any character. Note that we should avoid using these symbols "<,>,#,=" in the text to be coded for the same reason. With these exceptions, any other character or symbol that may be typed from your Apple's keyboard except control characters and escape sequences will be encoded correctly without creating any problems!! Another thing to be aware of is not to encode BASIC commands because they will be acted upon in the decoding process. The programs do work perfectly with my VIDEX 80 column card and in upper and lower case!

Readers who wish to further enhance the program may consider implementing one of the several "Input Anything" routines that have been published in previous issues of *Call -A.P.P.L.E.* This would then allow the use of commas, etc.

You should create your own personal "ENCODE" formulas in lines 120 to 210 so that your program is different from any others. Note that with five possible choices (0,1,2,3,4) and using 10 to determine the modulo there are 5 raised to the power of 10 (or 9,765,625) possible choices. This huge number of options should fairly well insure that what you select will not be easily decoded by others if they do not know what values you selected.

Do not use only one value, for example 4, because the encrypted text will become a simple substitution

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code, and very easy to decipher. Pick a sequence of values including 0,1, 2,3, and 4 in lines 120 to 210, although you may use the same value twice in sequence, it is much more difficult to "crack" the encoded text if no two adjacent values are the same!!

Here is an example of another choice for these lines:

```
120  IF M = 0 THEN A
       = A - 3
130  IF M = 1 THEN A
       = A - 4
140  IF M = 2 THEN A
       = A - 2
150  IF M = 3 THEN A
       = A - 3
160  IF M = 4 THEN A
       = A - 1
170  IF M = 5 THEN A
       = A - 0
180  IF M = 6 THEN A
       = A - 2
190  IF M = 7 THEN A
       = A - 1
200  IF M = 8 THEN A
       = A - 3
210  IF M = 9 THEN A
       = A - 2
```

You must be sure that the persons you wish to communicate with have the identical lines in their program as you do. There is nothing to stop you from having different codes in these lines for each person you may wish to communicate with, but you will have to remember which person has which sequence of codes or they will not be able to decode your messages once they receive them.

If you make any errors in entering the text into each of the strings, you can correct them by using the left arrow key and retyping the string. This will work until the "RETURN" is pressed, and the text is encoded.

Line 220 creates a new string S1$(N) by subtracting the value in lines 120 to 210 and then adding the next character by printing CHR$(A). Line 230 continues looping through each string until each letter of the string is encoded.

Line 240 asks if you wish to continue adding additional strings. If the answer is "Y," then C$ = "Y" and the program will loop back to line 60 where additional strings are typed and then encoded. Line 270 says that if C$ is not "Y," 1 is added to N and a new string, S$(N), is created with the value of "0." This will be used in the DECODE program to indicate the end of the strings in the array, and will be explained further when that program is discussed.

Lines 280 to 300 print out the encoded text so that you have a chance to see what this looks like. If you want to delete these lines, the program will still function. I like to see the encoded strings, but this is a personal preference. Now we must save the encoded text to our disk, and the next lines do this. Let's look at them.

Line 310 first opens a text file called, "CODEFILE," using the DOS command "OPEN." Note that all DOS commands must be preceded by a [Ctrl-D], in this case D$. "OPEN" creates a text file by the name selected if one did not exist on the disk before. Line 320 then deletes the textfile named. If you try to delete a file that is not on the disk, you will get a message that says, "FILE NOT FOUND," which is disturbing. Therefore, to prevent this from occurring, we first create such a file, and then delete it.

It is important to delete any previous CODEFILE, because any new data sent to a textfile will overwrite the old one, sometimes resulting in strange and unpredictable results!

Lines 330 to 340 open the text file once again and issue the DOS command to write data to the file. Lines 350 to 370 create a loop, writing the strings S1$(I) to the disk. These consist of the encoded text. Line 380 then closes the text file. It is important to close text files, because if this is not done, data might be lost by other DOS commands. Line 390 then prints the message that the program has done its job.

Save this program to your disk using the name, "ENCODE." If you run the program, you will be asked to enter strings. Type in some strings and hit RETURN when you have reached the end of the string. Remember that each string may be up to 240 characters in length. You may use spaces between words if you wish, and the strings will be encoded and decoded correctly, but it will be much more difficult for someone to try to decode your message if spaces are omitted between words. The message will still be legible when decoded.

When you wish to end adding additional strings, type a "N" when asked if you wish to continue. The program will then encode each string and save the encoded text on the disk in the text file, "CODEFILE" (as doing a catalog demonstrates). Very long strings may take a few seconds to be encoded, but short strings are encoded almost instantly.

Here are some examples of how the process functions. Enter as the first string, "RSTUVW" and it will be encoded as, "PPPUUU" which shows that the program is sufficiently complex to fool most cryptographers, especially if spaces are omitted between the words. Any effort to count letters and compare them to the standard English frequency charts should not work! If the string you type is, "RRRRR" it will be encoded as "PONRQ." Review the program, and refer to the ASCII screen chart to see why this is so.

Now that we have created a text file that contains our original data in an encoded form, we can use our modems and some form of communication package to send this encoded data to our colleagues via one of the electronic mail boxes without fear of it being read by anyone other than the ultimate recipient. I have sent letters this way and have been able to decode them without the slightest bit of trouble.

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How are we able to decode this message once it is received? Here is a program to do this. Let us look at it:

```
]LIST

10  REM

DECODE  BY RALPH H.SWERDLOW
      M.D.

 CALL A.P.P.L.E. : MARCH
      1984

20  I = 0
30   TEXT : HOME :D$
       =  CHR$ (4)
40   HTAB 10: PRINT "READING
      AND DECODING CODEFILE
      "
50   HTAB 10: PRINT "-------
      --- -------- --------"

60   PRINT D$;"OPEN CODEFILE"

70   PRINT D$;"READ CODEFILE"

80  I = I + 1
90   PRINT "THIS IS LINE
       # ";I
100   INPUT S$(I)
110   PRINT S$(I)
120   FOR C = 1 TO  LEN
       (S$(I))
130   IF  MID$ (S$(I),1,1)
       = "0" THEN  GOTO
       310
140 A =  ASC ( MID$
       (S$(I),C,1))
150 M = C - ( INT (C
       / 10)) * 10
160   IF M = 0 THEN A
       = A + 1 + 128
170   IF M = 1 THEN A
       = A + 2 + 128
180   IF M = 2 THEN A
       = A + 3 + 128
190   IF M = 3 THEN A
       = A + 4 + 128
200   IF M = 4 THEN A
       = A + 0 + 128
210   IF M = 5 THEN A
       = A + 1 + 128
220   IF M = 6 THEN A
       = A + 2 + 128
230   IF M = 7 THEN A
       = A + 3 + 128
240   IF M = 8 THEN A
       = A + 4 + 128
250   IF M = 9 THEN A
       = A + 0 + 128
260 S1$(I) = S1$(I)
       +  CHR$ (A)
270   NEXT C
280   PRINT
290   GOTO 80
300   PRINT D$;"CLOSE
       CODEFILE"
310 N = I
320   PRINT : PRINT :
       PRINT "THE MESSAGE
       WHEN DECODED READS
       : ": PRINT
330   FOR I = 1 TO N
340   PRINT S1$(I)
350   PRINT
360   NEXT I
```

Lines 10 to 30 should be very easy to understand. Line 40 prints the message "READING AND DECODING CODEFILE" in the top center of the screen and line 50 underlines the message. I personally dislike programs that do not tell me what they are doing, so I try to include statements in my programs to explain what is happening.

Lines 60 and 70 first open the text file with the name of "CODEFILE" and then instruct the computer to read the contents of the file. Line 80 increases I and then line 90 indicates which line is being printed. Line 100 asks our Apples to input to the computer the contents of the string S$(N) and line 110 prints out the string so that the user can read it. Line 110 may be omitted if you do not want to see the encoded text, but I like to see what is coming out of the disk.

Lines 120 to 150 serve the same purpose as do lines 90 and 100 do in "ENCODE." Line 130 is new, so let's look at it a bit. Refer back to line 270 of "ENCODE" which adds one last string with a value of "0." This is to indicate the last string in the array. Now when DECODE sees that the contents of the string is "0," it "knows" that this is the last string to decode, and the program jumps to line 300 and closes the text file. Lines 160 to 250 now add values to the ASCII value as were subtracted in the program "ENCODE." *They must be identical or the encoded text will not be decoded correctly!!* Because Apples like to print out characters with the high bit set, 128 is added to each value.

Lines 260 to 290 continue to loop through the strings, decoding the encoded text. Finally, after the last string is decoded, the text file is closed, and lines 310 to 360 print out an explanatory message and then each of the decoded lines of text!

Save this program with the name, "DECODE" on your disk and then run it. If you have created a CODEFILE with ENCODE, this file will now be decoded and you will see your original text appear on your screen. If you have a printer, turn it on, and run the program, and you will have a hard copy of the decoded text!!

Most of the word processor programs that use text files and the standard ASCII character values, may be used to edit and then print a document consisting of the encoded data in CODEFILE. In this way it is possible for you to type a letter which consists of the encoded text and mail it to friend or business colleague in a form that is not understandable by any others.

Here is a dirty but useful trick. Suppose that your word processor can not put out a hard copy of the CODEFILE, and yet you would like to send some secret information by mail. Here is how to do this. First run "ENCODE" to create a text file on your disk; type, "MONCIO" and a return. Next, type "EXEC CODEFILE." A list of each encoded string will be printed to paper with alternate lines saying, "SYNTAX ERROR." This is true because the file does not contain BASIC commands. Now you can mail this piece of computer printout to whoever you wish.

But if you have a hardcopy of the encoded text, how can you decode it?? Here is a program showing how to do so:

```
10  REM

       ENTER CODE
BY RALPH H. SWERDLOW, M.D.

CALL -A.P.P.L.E. : MARCH 1984

20 N = 0
30  HOME
40  HTAB 3: PRINT "WHEN ASKED. EN
     TER ENCODED TEXT STRING"
50  HTAB 3: PRINT "-------------
    ------------------------"
60 N = N + 1: PRINT
70  PRINT "ENTER S$(";N;") : ";
80  INPUT "";S$(N)
90  PRINT : PRINT "          MORE
    Y/N ?? : "
100  GET C$
110  IF C$ <  > "Y" THEN N = N +
    1:S$(N) = "0": GOTO 130
120  GOTO 60
130  PRINT : PRINT "THIS IS THE C
    ODE YOU ENTERED :"
140  FOR I = 1 TO N - 1
150  PRINT : PRINT S$(I)
160  NEXT
170  PRINT : PRINT "  NOW WRITING
     CODED TEXT TO CODEFILE"
180  PRINT : PRINT : PRINT "PLEAS
    E RUN PROGRAM 'DECODE' TO DE
    CIPHER"
190  PRINT : PRINT  TAB( 12)"THE
    ENCODED TEXT"
200 D$ =  CHR$ (4)
210  PRINT D$;"DELETE CODEFILE"
220  PRINT D$;"OPEN CODEFILE"
230  PRINT D$;"WRITE CODEFILE"
240  FOR I = 1 TO N
250  PRINT S$(I)
260  NEXT I
270  PRINT D$;"CLOSE CODEFILE"
```

cont'd on p. 47

A Software Vending Machine

ed magnin

SOME computer junkies are so wedded to their machines that they haven't time to shop for software. For them there's *Telephone Software Connection* in Torrance, Calif. Its computer stands ready 24 hours a day. Just phone in an order and wait for the program to be transmitted by telephone directly to the caller's machine." — *The Wall Street Journal,* August 26, 1982.

At 3:58 AM, the rest of his family fast asleep, via a few simple keyboard commands on his Apple, a man uses his *modem* to dial a distant computer system and is pleasantly surprised to see them answer so promptly. As soon as he enters his name, he is recognized as a steady customer and is asked to enter the matching password to prove it is really him. He proceeds to the menu of over 70 programs and asks for details on several. He makes his first selection. Right before his eyes, the distant computer takes control of his Apple, as it installs a short machine language "Linking Routine," and then the high speed countdown begins.

In a few short minutes, without moving from his arm chair, he has not only ordered, but actually received his selected product — right through the telephone! Following good sales practice, he is asked if he'd like to see anything else. Yes! He selects two more programs and they, too, are automatically saved to his disk. He is given an opportunity to leave comments (or questions he might have about a previous purchases). He chuckles as he types, "I sure like the convenience of doing business in my underwear!" He is thanked for his purchase and is automatically logged off the system. He CATALOGs his disk and sure enough there are his three programs. He types RUN and the program name and up comes his first program, greeting him by displaying its imbedded documentation.

The next morning in Torrance, California, a stack of paper and forms are loaded into a high speed printer and the previous days batch is printed, including a record of our caller's transaction, complete with a universal credit card charge form. One copy is for the bank, another is inserted in a window envelope and mailed to the customer to confirm his purchase via his credit card and give him a receipt for tax purposes.

. . . This is not a scenario for the future, but a description of a typical transaction with a company that has been sending software over the phone thousands of times a month for the past five years to callers from all fifty states: Canada, Mexico, South America, Europe, Asia, Australia, and the Middle East.

Why deliver software over the phone? There are many advantages, both to the software house and the consumer:

- Programs can be ready for sale much faster than via traditional methods — the first sales come in almost as soon as a new program is put on the system.
- Orders are filled promptly. The software house has an infinite supply of each program. The consumer never waits for a back-order!
- The consumer is always buying the most recent version of a program.
- If some "bug" manages to sneak by stringent quality control, free updates can be made available as easily as taking the original program.
- A direct relationship between the consumer and the software house means the consumer will know where to call if he needs customer service, and the software house will know which callers deserve that service (those that actually bought the program fair-and-square).
- With a highly automated sales system, the software house's staff is free to concentrate on real customer service, not just sales.
- Programs cost much less than they would have with a lot of fancy packaging.
- Programs are carefully screened for quality prior to acceptance for sale. The general quality and appearance of each one should bring the consumer back for others!

All that is needed to call and experience this for yourself is an Apple, a disk drive, the Hayes Micromodem II, the SSM modem card, a Novation Apple Cat II (with the optional firmware or the DCH Mirror ROM), or the Apple Communications Card and a modem. You don't even need a credit card to take some of the many free sample programs, but by leaving credit card info (American Express, Carte Blanche, Diners Club, Master Card or Visa), your account application can be processed so that later when you are ready you'll be able to make purchases. If you don't have a modem *yet,* don't fret. Programs can also be delivered to almost anywhere within days (not weeks) via mail.

Next time you get the software urge, it's good to know you've got a software vending machine as close as your modem!

(Telephone Software Connection can be reached via their 24-hour modem lines at (213) 516-9432.)

The author, a longtime A.P.P.L.E. member, is president of Telephone Software Connection, Inc. (of Torrance, CA), and is developer of their unique Teledelivery™ software vending system. He has also been active as a telecommunications consultant for the past five years.

Auto Modem

michael j o'neil

Auto-Modem $39.95
Computer Station
11610 Page Service Drive
St. Louis, MO 63141

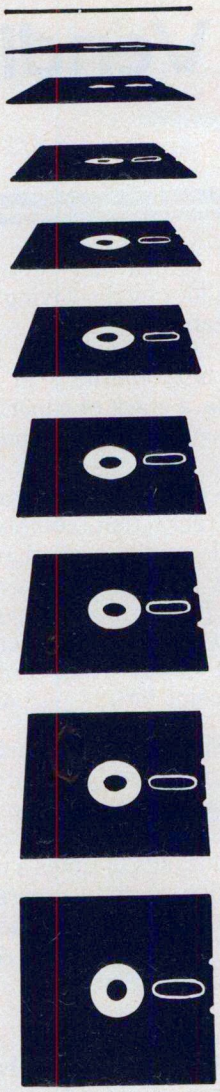
Overview

AUTO-MODEM is for the personal computer novice who is not yet familiar with the complicated world of data communications. It is a "turnkey" system which permits the Apple user with no prior programming or terminal experience to communicate over the telephone lines to other computers. This software package from Computer Station, Inc. avoids much of the confusion in computer-to-computer communications by sticking to the most basic of functions, and leaving the "bells and whistles" to more sophisticated users and programs.

AUTO-MODEM was written entirely in Applesoft specifically for the proud new owner of an Apple and a D.C. Hayes Micromodem II who has just discovered that he will have to buy, write or modify a simple terminal program to make use of his latest investment. At $39.95, this software package is an economical means of "getting on the air" with the SOURCE, a favorite bulletin board system, or a best friend's Apple. AUTO-MODEM neatly ties together and builds upon many of the program ideas and features supplied by D.C. Hayes on the diskette that comes with the Micromodem II. AUTO-MODEM makes them all accessible through menu-driven software without the programming that would otherwise be required to put them all together.

Compatibility

AUTO-MODEM requires a regular 48K, forty-column Apple][with Applesoft, DOS 3.3, a disk drive, and the D.C. Hayes Micromodem II. A printer is optional. The program runs equally well on the Apple *II*e in forty-column mode with the CAPS LOCK on. Lower case is not supported. AUTO-MODEM runs only with the Hayes Micromodem II or the Modem II from Multitech. It will not operate properly with other modems such as the Hayes Stack and the Hayes Smartmodem 1200. AUTO-MODEM makes extensive use of the Hayes Micromodem II firmware, which does not support eighty-column boards.



CALL -A.P.P.L.E.
SOFTWARE REVIEWS

The Micromodem II uses only pulse dialing (like your old rotary-dial phone), and does not support Touch-Tone dialing. However, most telephone company Touch-Tone phone equipment will correctly recognize and obey the Micromodem pulse-dial signals. On the other hand, some Touch-Tone based private switchboard equipment such as you may have at work, will not work correctly with the Micromodem II dialing features. AUTO-MODEM has the capability to download Applesoft programs from another Apple via the telephone line, however it is not able to download ASCII text files in the same way as "smart terminal" programs. AUTO-MODEM's compatibility with many popular printers is limited.

Features

AUTO-MODEM provides a set of unprotected (ie., copyable and listable) Applesoft programs which add the advantages of the Hayes Micromodem II, including automatic telephone dialing, automatic telephone answering, and automatic hanging up of the telephone line to a basic "dumb terminal" program. The main menu of AUTO-MODEM offers:

1. AUTO-DIALER
2. AUTO-ANSWER
3. AUTO-MESSAGE
4. PHONE LIST
5. SELFTEST
6. FILE MAINTENANCE
7. QUIT

AUTO-DIALER is a program which will dial the telephone from a list of twelve computer names and phone numbers saved on disk, or from a phone number entered directly at the Apple keyboard. When this program is selected from the main menu, the user is presented with a list of twelve names and phone numbers. Dialing is as simple as selecting one of the pre-programmed phones by menu number. Or the user can type the desired phone number directly at the keyboard.

The screen clears and shows the Micromodem II status as it dials, awaits a connection, and begins the terminal mode. The top of the screen

displays at all times how to exit the terminal mode after the distant computer hangs up the phone. The AUTO-DIALER documentation does not mention, however, that you must type a [Ctrl-A] [Ctrl-Z] before exiting the terminal mode in order to hang up the Micromodem yourself when the other computer (such as TELENET) does not terminate the connection for you.

One feature that separates AUTO-MODEM from other "dumb terminal" programs is its ability to download BASIC programs into your Apple from a distant computer over the telephone lines. The AUTO-DIALER documentation points out this feature, and also explains what you must do to return to the AUTO-MODEM menu after you complete a download. The manual assumes that the other computer is programmed to accomplish the necessary downloading steps for you. I did not see any step-by-step instructions on how to do the download on your own initiative.

Another facility that makes AUTO-DIALER smarter than your average "dumb terminal" program is its ability to turn the printer on and off at any time during the conversation with the distant computer. The printer can be toggled easily with the entry of a few control keys. However, this feature is of limited usefulness with slow printers.

AUTO-DIALER's printer logging feature is unbuffered, which means that data will be lost if the printer is slower than the incoming data stream, if it takes too long to perform a physical carriage return, or if the printer has no memory of its own to temporarily hold incoming characters until they can be printed.

AUTO-DIALER's printing feature depends on having either a relatively sophisticated printer or an understanding time-sharing or bulletin-board computer to communicate with. If your printer is not fast and/or buffered, then this feature will not work unless the computer you are talking to supports "null characters" or other means of providing the delays needed while your printer catches up.

AUTO-ANSWER also has a very interesting feature called Remote Console Mode, which permits a friend to dial your Apple and operate it from his remote location. After your Apple has entered AUTO-ANSWER's terminal mode, your friend types [Ctrl-R], then "RC" plus a RETURN at his remote keyboard. The Apple then responds "IN REMOTE CONSOLE MODE" and the Applesoft "]" prompt appears. He may now RUN, LOAD, LIST, CATALOG, etc., from the remote location just as if he was sitting directly in front of your Apple. To quit Remote Console Mode, he simply types "RUN AUTO-ANSWER" which hangs up the phone, and sets up the Apple to wait for another phone call.

AUTO-MESSAGE is a simple Apple-operated telephone answering machine which listens for computer messages rather than voice messages. When selected from the main menu, this program enables the Apple to answer the phone, send a short greeting message to identify that your Apple has answered, then invites the caller to type in a message of up to ten (forty-column wide) lines. The message is logged, saved to the diskette, and the Apple begins waiting for another call. When you return to your Apple, the screen indicates how many messages you have received and permits you to review them on the screen or printer. This program automatically "cleans the slate" of old messages each time it is run.

PHONE LIST (AUTO-CALLER) is an enhanced version of the PHONE LIST program provided on the Apple DOS 3.3 System Master Diskette. The original program was provided by Apple Computer to keep track of a list of 150 phone numbers (your very own computerized phone directory). PHONE LIST allows you to add, delete, change, list, view and search for phone numbers in your directory. When searching for a phone listing, PHONE LIST will look for all listings with a certain name, or all listings with a particular letter appearing in the name.

The AUTO-CALLER enhancement consists of adding the Micromodem's dialing feature to place the call for you once the desired phone number has been found in the directory. AUTO-CALLER is designed for voice calls only. It will not work if

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you try dialing a computer—use AUTO-DIALER instead. When AUTO-CALLER is used, the Apple dials the call automatically for you, then "beeps" to tell you to pick up the phone to talk.

Your phone instrument must be on the same line as the Micromodem II. You have to remember to RETURN to hang up the Micromodem after you have picked up the phone to talk; otherwise it keeps the phone line open until you RESET or turn off the Apple. This could lead to unnecessary long distance calls. Adding the AUTO-CALLER enhancement requires the use of the RENUMBER program on the DOS 3.3 System Master Diskette. The AUTO-MODEM documentation gives step-by-step instructions on how to use RENUMBER to combine the PHONE LIST program from the System Master Diskette with AUTO-CALLER from the AUTO-MODEM diskette.

SELFTEST is a modified version of the diagnostic program supplied by D.C. Hayes with the Micromodem II. If the Micromodem seems to be acting up, you simply unplug the Microcoupler cable and select this program from AUTO-MODEM's main menu. In approximately a minute and a half, this program completely checks out the Micromodem circuits and firmware, then reports the test results to the Apple screen.

FILE MAINTENANCE is used the first time you boot up AUTO-MODEM, or any time you want to change either the general information or the twelve computer phone numbers which AUTO-MODEM saves on the diskette in the SYSTEM. INFO file. This file keeps your first and last name, area code, Micromodem slot number, printer slot number, and up to twelve remote computer phone numbers. With this program, it is a simple matter to add, change or delete any of the computer phone numbers to be dialed by AUTO-DIALER.

User Friendliness

AUTO-MODEM is user friendly throughout. Although it is basically only a "dumb terminal" program with automatic dialing capabilities, it greatly simplifies the process of data communications. The software is totally menu-driven. There are only a few cases where the user must learn command codes; most of the time he can operate it successfully with only the help of the menus. AUTO-MODEM is reasonably input crash-proofed: it won't accept alphabetical characters in numeric inputs, and vice versa. [Ctrl-C] forces the user to re-enter the SYSTEM. INFO file data and computer phone numbers. RESET returns you to the Applesoft "]" prompt and hangs up the phone.

Documentation

AUTO-MODEM has minimal documentation. In typical Computer Station style, this program has a sixteen-page paperbound manual which thoroughly goes through the operation of each of the menu options in turn. Although it lacks finishing touches such as a table of contents or appendix, the AUTO-MODEM manual is neatly printed, easy to read, and too short for the user to have difficulty finding any needed information. The manual might have been more attractive and helpful to the novice user had it included more diagrams, sample screens, and examples.

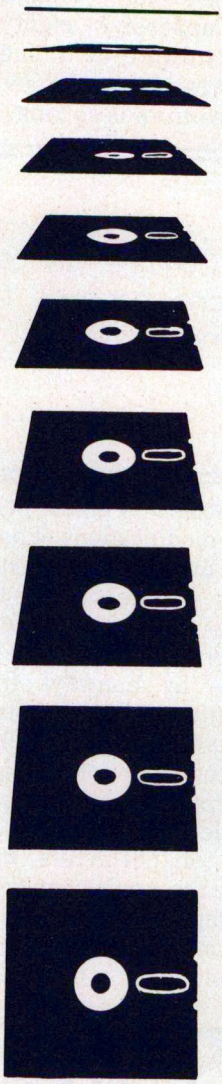
Conclusion

AUTO-MODEM is simple to use, has some neat features, and is inexpensive to own. Thus it may have some appeal to home users of the Apple who are just getting into the world of data communications. It is, however, a program most users will quickly outgrow. Many telecommunications users start off in a "dumb terminal" mode, using the Apple only as a terminal to the SOURCE, a bulletin board system, or another microcomputer. Then they discover all the information they'd like to "capture" on the Apple diskette or run off on the printer. As soon as the telecommunicating Apple user gets to this stage, he must decide whether to attempt program modifications to AUTO-MODEM, or to purchase one of the many "smart terminal" programs which offer these and many other handy features. Luckily, a few of the more powerful terminal programs have still managed to retain the apparent simplicity and user-friendliness that AUTO-MODEM offers. I would advise careful analysis of current and future data communications needs before purchasing this or any other terminal program for your Apple.

Hello Central!

michael j o'neil

Hello Central! $99.95
Howard W. Sams & Co., Inc.



CALL -A.P.P.L.E.
SOFTWARE REVIEWS

Overview

YOU anticipate that you will be using your Apple more often to communicate with other computers, and that you will need more than just "dumb terminal" capabilities because you will be sending and receiving files of information. You naturally want to get all the basic features in a communications software package, without spending too much. Well, you are in luck... From Howard W. Sams & Co. comes Hello Central! — a useful data communications package with all the features an average Apple owner would need for personal use. The package includes not only simple modem support, but also file upload and download facilities. It also includes a text editor, a feature not offered by all the competitive modem programs. This feature is extremely useful for preparing text before or after transmission. Hello Central! also provides handy automatic dialing and logon features that can be tailored to the systems you talk to most often. The documentation has just been updated, and is now even more friendly, complete, logical and easy to follow. Hello Central! covers the complex topics of data communications easily without swamping the casual user with unnecessary jargon.

Compatibility

This program was designed for the Apple][Plus with 48K memory and a forty-column display, but it works equally well with the Apple //e and other Apple][-compatible systems in forty-column mode. It was designed to work with the most common Apple serial interfaces: the Hayes Micromodem II, the Multi Tech Modem II, the Apple Communications Interface Card, and the SSM AIO Board. The program is not compatible with the newer Apple Super Serial Card. Hello Central! can be used with Apple][or][Plus with or without a lower case adapter, as well as the Apple //e with the CAPS LOCK key depressed. When used with the Apple][in lower case mode, the program changes the cursor to an underscore ("_") to differentiate from the normal all caps mode (whose cursor is the familiar blinking box). Hello Central! uses the ESCAPE key as a shift key, and also supports the common shift-key modification. When using the program with the Apple //e, I found that the SHIFT and CAPS LOCK keys did not work properly until I pressed the ESCAPE key twice to get into the program's caps lock mode. With the //e, both cursors are replaced by the //e blinking checkerboard. Also, with the Apple //e and other Apple][-compatible systems, you have to be careful to remember that many of the special character keys such as @, ',",^,*, and = have moved. Users should be aware that Hello Central! will not operate properly in eighty-column mode.

Several new features have been added in the most recent version of Hello Central! which make it compatible with more Apple][look-alike systems. Those of you concerned about disk access speeds will be glad to know that Hello Central! now comes with a copy of Diversi-DOS,[1] the leading Apple DOS 3.3 speed-up modification from DSR, Inc. The Hello Central! manual encourages you to use this handy DOS enhancer with your other Apple][software by sending $30.00 to DSR, Inc. By return mail Bill Basham at DSR will provide you with the latest Diversi-DOS updates, utilities and documentation. Several good reviews of the excellent features of this DOS enhancer have appeared recently. The Diversi-DOS enhancement speeds up the operation of Hello Central! appreciably: the boot-up is 45 percent faster than under normal DOS 3.3. Transferring from the main menu to the editor is 50 percent faster.

For those of you with hard disk, Hello Central! is also compatible with the Corvus. The Hello Central! documentation gives specific instructions for installation on the Corvus. Other hard disks running a modified Apple DOS can also be used with Hello Central! if you are familiar with how to make similar changes based on the hints provided in the Hello Central! documentation, as well as the requirements of your hard disk operating system.

[1] *Diversi-DOS* reviewed by Robin Raygor in Creative Computing, December, 1983, pages 90-91.
Dandy DOS Enhancer reviewed by Steven A. Schwartz in In-Cider, April 1983, pages 56-61.

For those of you who communicate as I do with mainframes and time-sharing computers with special communications protocols for data flow control, and/or interrupt capabilities, Hello Central! now permits the user to enable special "Break" and "X-ON/X-OFF" keys via its "Change protocol" menu option. If you frequently transfer files to mainframes, you will probably need these capabilities. When the buffer fills with downloaded text from another computer, Hello Central! automatically sends a [Ctrl-S] to the other computer as the signal to stop while the Apple automatically saves the current text buffer of information to the disk to make room in memory for more. Frequent users of the file transfer capabilities will also appreciate the speed-up feature of Hello Central! which automatically switches to half-duplex mode while sending files, even when terminal communications have previously been set to full duplex.

Features

Hello Central! provides all the standard telecommunications features as well as upper and lower case inputs and outputs. The program permits both single and dual disk drive operations conveniently. The program gets around the limitations of the Apple's forty-column screen without expensive eighty-column plug-in hardware by a unique internal wordwrap feature which prevents split words from occurring.

Hello Central! has complete telephone handling facilities, including automatic dialing

A unique text editor permits on-the-spot modifications of both incoming and outgoing information. It is character-oriented, rather than line-oriented. Every character, rather than every line, is individually addressable by numbers from 0 to 18,000 (the maximum size of the Hello Central! text buffer). Because of its character orientation, Hello Central! permits any number of lines of any length, until the maximum number of characters have been copied to the Apple memory. Some of the editing operations are more awkward than the best full-screen word processors, but Hello Central!'s editor is still quite powerful.

The Hello Central! editor menu includes commands to jump to, or to mark any individual character in the buffer; to search and replace; to copy, delete, and insert; to scan the buffer; or to perform routine DOS commands. One handy feature is the "Scan buffer" command which allows you to quickly review the text currently in the buffer without disturbing your communications with the other computer. The scan speed may be controlled, stopped and restarted to suit your need. Another helpful feature not found in all text editors is the global "Search and replace" facility which finds and changes some or all occurrences of any specified text strings according to your command.

The heart of the text editor is the text buffer, a section of Apple memory 18,000 characters long, which holds the incoming or outgoing text generated during your conversation with another computer. When turned on, this buffer permits upload and download capability with any ASCII text file, be it electronic mail, Applesoft or binary programs (converted to text format), VISICALC files, or whatever. Hello Central! is unique in its use of the text marker concept: with this program, you can set up to five different markers, labeled with a mnemonic chosen by you, and assigned to particular points in the text which might be important for review, insertions, paging, further downloading, etc. By carefully setting and resetting the buffer markers, you can avoid cluttering your downloaded disk files with text you don't wish to save, but which you don't realize is not worth saving until after you have seen it.

Hello Central! has complete telephone handling facilities, including automatic dialing by either name or phone number (using the Hayes Micromodem II); automatic logon macro-command transmission; automatic phone answering and dialing (with the Micromodem II). Your Apple can also become an "electronic mailbox" and automatically "take a message" from other computer users. Hello Central! supports separate, unlimited number directories for data calls and voice calls. Howard W. Sams & Co. will even provide program updates (when available) via modem. A long distance telephone

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number to call for fully staffed, end-user technical support is displayed right on the title screen at boot-up.

User Friendliness

Bruce Kallick, the author of this program, has provided many thoughtful features to make Hello Central! easy for the uninitiated to use. The new program documentation, edited by Phil Debrabaut, includes a complete three-lesson tutorial covering local program operations, the terminal mode, and using the text editor.

Within the first few pages, the Hello Central! manual very carefully and helpfully goes through the program's input conventions. Two full pages are devoted to guiding you through the keys reserved throughout the program for cursor moves, upper and lower case handling, typing error corrections, and special character inputs. Operating features of the program show the same care for user friendliness. For example, the program is guarded against accidental RESET's and [Ctrl-C]'s; the menus are set up so that you can always back out of a selection and return to the previous menu by typing a simple keystroke.

Menu selections are easily accomplished by using the Apple's arrow keys to move the menu cursor (also an arrow). You use the SPACE bar to confirm your selection, or you may select an item directly by entering its unique single keystroke shown on the menu. When you move the cursor with the arrow keys, the program will remember your selection and place the "arrow" cursor in the same place at the selected item automatically the next time you return to the same menu. This speeds repetitive operations considerably.

Switching between the menus and terminal mode is quickly and easily accomplished with single keystrokes. Another unique feature other terminal programs would be wise to include is the practice of restoring the previous terminal dialog to the screen when returning to data communications mode from the Hello Central! menu. How many times have you forgotten what you were saying to the distant computer while switching between the Apple's menu screens and back to the terminal mode?

Apple users with a concern about protecting their software investment, or with an interest in modifying or exploring the programs will appreciate the fact that Hello Central! is copyable and listable with standard Applesoft and DOS tools. This simplifies operation of the program for you since you can place a working copy of the program on each of your data diskettes (a must for one-drive systems), and can make personal backups as necessary for protection against disk "crashes."

Although Hello Central! does not take advantage of additional hardware such as the eighty-column boards frequently used by data-communicating Apples, the program substitutes an internal wordwrap feature with user-adjustable text width. When you input large amounts of text, you can use a "power typing" mode which automatically provides carriage returns at the linelength you have previously selected. This variable linelength wordwrap feature also works when downloading text from other computers. Overall, Hello Central! is very "user-friendly," from its simple, straightforward configuration program to its handy printer control features and its automatic CATALOG feature available with all disk operations.

Program Operation

The first time you boot up Hello Central!, you should select the "Reconfigure" option from the "Primary Commands" menu. The "Reconfigure" menu prompts you for your printer slot number, modem slot number, modem type, and the availability of a lower case adapter on your Apple. The first time through, you would probably also select the "Update directory" menu to add, change, or delete the names and phone numbers of your favorite dial-up computers. You could also use this feature to save your logon sequence as one or more "Macros." Under normal circumstances, you would not use the "Reconfigure" or "Update directory" menus again until either you change hardware or you change the remote computers, phone numbers or passwords you are dealing with.

Next time you boot up Hello Central!, you would probably select "Change protocol" to suit the computer you will be dealing with, then select "Place a call" and "Call terminal mode menu." You would next "Select duplex" from the "Terminal Mode Commands" menu to agree with the setting used by the computer you're dialing. Then you could "Transmit macro" to automatically send your logon message. Switching from the "Terminal Mode Commands" menu to the terminal dialog screen is as simple as a RETURN; and to get the menu back again, you merely touch the Apple's right arrow key.

Now you're ready to take advantage of Hello Central!'s really powerful upload/download and printing features. The program permits you to send text from an Apple disk file one line at a time, send a partial file, or send the whole file—waiting for a prompt from the other computer at the end of each line transmitted. You can now even tell Hello Central! how long to wait for each prompt before going on to send the next line of text! Few other Apple "smart terminal" programs permit the line-at-a-time transmission method, which is extremely handy for anticipating and saving in advance the lengthy sequence of commands you would need during a session with one of those expensive time-sharing computers. When uploading a line at a time, Hello Central! automatically switches to half duplex transmission for the duration of the upload; this saves transmission time. Note that you can simultaneously upload the commands from the Apple diskette while downloading the distant computer's responses to the text buffer for subsequent printing, saving to disk, review and/or analysis. Simultaneous upload/downloads are not possible with very many other Apple "smart terminal" programs.

The Hello Central! downloading facility is switched on and off from the "Terminal Mode Commands" menu. When downloading is on, incoming text is stored in the Apple's memory. In half-duplex operation, outgoing text is stored as well. Downloaded text characters are stored exactly as received, including lower case, control characters, etc. In half-duplex mode, for example, the [Ctrl-H]'s you use to correct typing errors with the Apple's left-arrow key count as characters and are stored in the text buffer, even though

they're difficult to spot when scanning the buffer. You can even enter characters unavailable at the Apple keyboard by entering their hexadecimal equivalents in the form of "^xy," where x and y are the two hexadecimal digits corresponding to the mysterious character (see your Apple manuals or Hello Central!'s handy Pocket Reference Guide for details).

You might want to edit the contents of the text buffer before saving it to disk or printing it. In this case, you would merely "Call primary menu" and then select "Call editor" to access that capability. The speed of the transition from the "Primary Commands" menu to the "Editor Commands" menu has been improved considerably by the use of Diversi-DOS. The switch now takes approximately seven seconds, even though you are actually swapping in a large 60-sector Applesoft Basic program from disk.

Another nice feature is that the text buffer is preserved in the process, so no further time is wasted saving or reloading the actual text itself. One spot which operates perhaps a little slowly is the carriage return delay while in the editor's buffer insert mode. I presume this has to do with the amount of processing the Apple must do while moving existing text to make room for additional characters. One other caution is that, as user-friendly as Hello Central! is , the program does not give you a second chance to confirm that you really mean to "throw it all away" when you select "Empty buffer" from the "Editor Commands" menu. Once you invoke this menu selection, your text is erased for good.

The user should be warned of one significant problem: If you are currently typing in lower case and attempt to SAVE a downloaded file, the filename will be in lower case as well and virtually impossible to retrieve without resorting to a disk edit utility.

Documentation

Hello Central!'s documentation has been upgraded to the new IBM PC-style slipcover box and "D"-ring binder. Using larger, easier to read type, and clearer line drawings in place of menu screen photos, Howard W. Sams & Co. has improved the readability of already clear, non-technical explanations for all the terminology required to understand and operate the Apple in the data communications environment. Now for example, the manual integrates information previously provided in a two-page addendum called "Using a Printer with Hello Central!" This section of the documentation goes carefully through the steps to boot the program, load a text file, turn the printer on, and send the text to the printer. The program itself allows you to save those complicated printer control codes you always need, but always forget, to take advantage of your printer's special printing modes. In another example, the opening section of the manual covers "Input Conventions"; here the author takes care that all such terms as "Inverse capitals" are carefully spelled out and placed in their proper context. The program manual also contains an excellent 12-page glossary of data communications terminology as complete as any I've seen since VISITERM. The index has been greatly expanded, too, for easier cross-reference. The helpful "Product Notes" addenda of earlier editions have also been integrated directly into the appropriate chapters of the newest version of Hello Central!'s documentation. The interesting photo and biographical sketch of the program's author, Bruce Kallick, has been retained in the new manual.

A new Pocket Reference Guide is now included with the documentation. This card covers the conventions for all editor commands, video menus and cursor movement commands. There is a five-page fold-out menu tree covering "where you are" with all options shown for all the Hello Central! menu screens. The card rounds out its helpful information with complete Apple and ANSI charts showing the decimal, hexadecimal, octal and character representations of all ASCII character codes. The manual now also includes a DOS error code table, since Diversi-DOS indicates disk errors by number rather than by traditional text error message.

I had problems following the earlier editions of the documentation in the section which described "Sending Program Files." The new documentation indicates that this feature has been signifcantly enhanced. The latest documentation makes it clearer that after selecting "Create a program text file" from the "Primary Command" menu, Hello Central! saves a short "capturing" text file to the disk. When you have finished creating the "capture" file, the manual now is more clear in stating that you should "Exit program" to the BASIC "]" prompt, load the program you wish to "capture," and then type "EXEC X.filename," where "filename" is the name you told Hello Central! to give to the text file version of the program. The manual still doesn't say that you should then reboot or rerun Hello Central! to actually accomplish the program upload.

I was surprised to find that you can access Apple diskette files only from the "Load from disk" option on the "Editor Commands" menu and the "Upload a file" on the "Terminal Mode Commands" menu. One feature that I did not find described in Hello Central! or its documentation, but that I look for in "smart terminal" programs, is the means for creating a new text file while off-line. I use this feature for putting together text files containing my electronic mail, or files of commands prepared for my friendly neighborhood time-sharing computer before I log on, so that I can upload them from diskette and use my time on the remote system more effectively.

Conclusion

Overall, I found Hello Central! to be an excellent "smart terminal" program for personal use. Unless you are seeking a "professional" version with such capabilities as high-speed operation, business computer terminal emulation, sophisticated error detection/correction and the like, I think you will find Hello Central! an extremely good buy for the $99.95 retail price. I haven't seen a program with a simpler approach to documentation and telecommunications features, although I have seen "smart terminal" programs that are even simpler to operate. For user friendliness, simplicity, and quality of documentation Hello Central! deserves an "A" grade.

THE SPREADSHEET SHEET

Data Analysis (part 4)

jeffrey jacques/phd

Introduction

IN the last article we noted how to create efficient worksheets for the building of crosstabulations — i.e., tabular displays which present the joint distribution of data. Although these tables are excellent for indicating the nature of the joint distribution, they can get quite large and unmanageable. Further, just as there are summary statistics which can be used to describe each single variable, there are summary measures which can be used to describe the joint distribution. They are most often called measures of association.

Some General Thoughts on Measures of Association

Before exploring how to modify our crosstab worksheet so that it includes appropriate summary statistics, a quick digression into the ideas emphasized by measures of association is essential. Measures of association succinctly state:

1) whether or not a relationship exists between the variables,
2) the strength of the relationship, and sometimes,
3) the direction (negatively or positively associated) of the relationship.

Perhaps the best way to conceptualize measures of association is through the ideas of prediction and reduction in error. The basic question answered by such statistics is: Does knowledge of the explanatory variable (e.g., sex code) and the the joint distribution of the variables improve our prediction of the variable of interest (e.g., faculty salary) beyond what we could estimate from the information contained in just the variable of interest (e.g., faculty salary)? Say what? Well, let's examine this question more closely by dividing it into its logical parts. We can do this best by looking at the concept of proportionate reduction in error (PRE). PRE may be summarized by noting the following:

1) If I had no knowledge of the joint distribution, then my best predictor of the variable of interest would be, most often, its appropriate measure of central tendency (e.g., mode category or mean value).
2) When I know the explanatory variable and the joint distribution, how much does it help in reducing the prediction errors of the variable of interest, and
3) Express this improvement in terms of proportionate reduction in error.

These ideas may be understood more easily by looking at a set of crosstabs. We will continue to use the same variables we have been exploring thus far — faculty salary and its relationship to sex codes. Let's examine three hypothetical crosstabs using these variables. See Table 4.1.

Faculty income is listed once on the left hand side of the table and sex code is listed across the top. The body of each of these three tables is composed of the number of faculty members who have both attributes. In Part a of the table, all the faculty reported incomes of $16,000 or less per year. All males and females would have to have the same income category. We do not need, therefore, information contained in the joint distribution to help improve our prediction of faculty income.

TABLE 4.1

HYPOTHETICAL DATA FOR THREE SITUATIONS

Faculty Salary	Part a. Sex			Part b. Sex			Part c. Sex		
	Female	Male	Tot.	Female	Male	Tot.	Female	Male	Tot.
<=$16000	50	50	100	50	0	50	30	20	50
>$16000	0	0	0	0	50	50	20	30	50
Total	50	50	100	50	50	100	50	50	100

In Part b of this same table, 50 faculty earned $16,000 or less while 50 faculty earned more than $16,000. Whichever category of faculty income we would choose — and use it as our predicted value, would leave us with a 50 percent error rate. If we examine the joint distribution, however, then, when we know that the sex of the faculty member was female we would predict a salary of $16,000 or less and when that the sex of the faculty member was male we would predict a salary of more than $16,000. The knowledge of this joint distribution enables perfect prediction, at least for this hypothetical data set.

Part c of this same table is a more realistic outcome. Females were more likely to earn $16,000 or less and males were more likely to earn more than $16,000. Sex code was, therefore, helpful in predicting faculty salary category. But not all females earned $16,000 or less nor did all males earn more than $16,000. We no longer have perfect prediction of salary even though sex code did reduce our errors in predicting salary. How much did it help? PRE helps us answer this question.

Proportionate reduction in error statistics such as: (1) lambda, (2) gamma, (3) Pearsonian RΛ2 and EtaΛ2 summarize whether or not a relationship exists between the variable of interest and one or more explanatory variable, and the degree to which knowledge of the joint distribution of these variables will reduce our errors in prediction of the variable of interest. There are, of course, many other measures of association. These are, however, the most widely used for data analyses.

By extending our expertise developed last time, we will modify the contingency table worksheet, use the tabular values of the crosstab as the source of data, and compute PRE statistics.

Modifying the Worksheet to Include Measures of Association

The first PRE measure of association to be included in our modified worksheet is asymmetric lambda. Asymmetric lambda simply computes how much we can improve our prediction of the variable of interest (e.g., faculty income category) from our knowledge of each category of the explanatory variable (e.g., faculty sex) and their joint distribution. Lambda uses the modal or maximum frequency categories in the computational procedure. Saying this in a slightly different way, by finding the modal income category for each attribute of sex, lambda summarizes the proportionate reduction in error beyond using the faculty modal income category. The formula for asymmetric lambda is:

$$\text{Asymmetric lambda} = \frac{\text{Sum}(f_i) - F_d}{N - F_d}$$

where:

$\text{Sum}(f_i)$ = sum of the largest frequencies of each attribute of the explanatory variable across all attributes

F_d = the largest frequency or modal values for the variable of interest

N = the total number of cases in the joint distribution

Using row 54 of your worksheet from last time, we can insert the phrase "Asym. Lambda (with Income dependent) = " in columns H through M. In column N (cell N54) we can enter the equation:

```
((@MAX(I47...I49)+@
MAX(K47...K49))-@MAX
(M47...M49))/(M51-@MAX
(M47...M49))
```

The first @MAX function finds the largest frequency for column I (e.g., modal income for female faculty), and the second @MAX function finds the largest frequency for column K (e.g., modal income for male faculty). The largest category of the variable of interest (e.g., faculty salary) is found with @MAX(M47...M49). The number of cases is listed in cell M51. Once the equation is entered in cell N54, the value .2 should appear — if you are using the worksheet built last time. Okay, what does an asymmetric lambda value of .2 tell us? Well, using the minimum of assumptions about the data, we can reduce the predicting errors of faculty salary category by 20% when we know faculty sex code.

When both variables are constructed so that the categories for each are orderable, then the most widely reported measure is Gamma. The formula for Gamma is:

$$\text{Gamma} = \frac{\text{Sum}(f_a) - \text{Sum}(f_d)}{\text{Sum}(f_a) + \text{Sum}(f_d)}$$

where:

f_a = the frequency of agreements or like orderings

f_d = the frequency of disagreements or unlike orderings

Gamma summarizes the degree of association, as well as the direction of the association, by determining the degree to which the predominance of the ordering of the variables is maintained. The equation for cell K55 is:

```
((I47*K49)-(K47*I49)) /
((I47*K49) +(K47*I49))
```

The value displayed in cell K55 should be .384615. According to Gamma, the relative reduction in error is 38%, approximately, when you know the joint distribution and the ordering of the variables.

The Pearson product moment correlation coefficient, and its square (RΛ2), are measures of association which state the degree to which the variables are related in a linear fashion. As in any straight line equation, once you know the summary statistics of each variable and the covariation between the variables, you can easily determine the slope and intercept points. Take a few minutes and examine Table 4.2, columns P and Q. I'll wait. . . .

In the computational space, I have assigned for each variable a value of 0 for the first category and a value of 1 for the second category. Coded mean and standard deviation values, therefore, can be computed easily — see rows 43 through 46. (I have included the zero values so that you may see more easily the full computational strategy. You may, of course, omit any elements where a value is multiplied by zero.)

To compute the sum of the cross-product deviations (or how far each score cell deviated from the mean scores), simply follow the formula listed for cell Q47. Since the slope of a regression line is equal to the covariation or sum of the cross-product deviations divided by the amount of variation in the explanatory variable, compute the variation in X (cell Q49), divide this new value into the sum of the cross products by entering the equation +Q47/Q48 into cell Q49. (Some of you may wish to compute the intercept point as well. So, I have listed its equation in cell Q50.) The Pearsonian r value may be computed by multiplying the slope by the ratio of the standard deviations. The resulting value will tell you the direction (positive or negative) of the relationship. The square of this value (typically called the coefficient of determination and reported as R^2) will tell you the degree of reduction in error when predicting the variable of interest from this straight line equation beyond using the average coded value — in this case, average salary. (If you didn't get this idea completely, don't worry. We will explore these ideas more fully next time.)

The final measure of association with which we will deal here summarizes the degree to which you can reduce your errors in predicting the variable of interest by using the attribute or category mean values rather than the grand mean value. For example, rather than predicting everyone's salary to be the average of all faculty members, use the average salary of females to predict female salaries and the average salary of males to predict their salary.

Eta squared summarizes the degree to which using these category salaries is an improvement over and

TABLE 4.2

WORKSHEET FOR 2X2 CONTINGENCY TABLE ANALYSIS

```
==========================================================================================================

     H      I      J      K      L      M      N          O          P      Q

39        Crosstabulation of :   Income by Sex                      Comp.  Space
40 ==================================================              --------------
41                    Sex                                           Pearsonian r
42 Income ------------------------------  Total                     --------------
43              Female       Male                                   mean Y= ((0*M47)+(1*M49))/M51
44 ------------------------------------------------                 sd  Y =@SQRT(((((0-Q43)^2)*M47))+(((1-Q43)^2)*M49)
                                                                          /(M51-1))
45            N      Pct.   N       Pct.   N      Pct.              mean X= ((0*I51)+(1*K51))/M51
46 ------------------------------------------------                 sd  X =@SQRT(((((0-Q45)^2)*I51))+(((1-Q45)^2)*K51)
                                                                          /(M51-1))
47 <=16000      a  @ROUND     b  @ROUND +I47+K47 @ROUND              cpd x&y see below
48                                                                   var X = ((((0-Q45)^2)*I51))+(((1-Q45)^2*K51)
49 >16000       c  @ROUND     d  @ROUND +I49+K49 @ROUND              slope = +Q47/Q48
50                                                                   intcpt= +Q43-(Q49*Q45)
51 Total     @SUM    @SUM    @SUM   @SUM   @SUM    @SUM                r   = Q46/Q44*Q49
52 ------------------------------------------------
53                                                                   Eta Squared
54 Asym.  Lambda  (with  Income  dependent)  =  (see below)          --------------
55 Gamma                = ((I47*K49)-(K47*I49))/((I47*K49)+(K47*I49))  mean Y= ((0*M47)+(1*M49))/M51
56 Pearsonian r =       +Q51      R^2  =  +J56^2                     TSS   = ((0-Q55)^2*M47)+(1-Q55^2*M49))
57        intcpt=       +Q50                                         meanY0= ((0*I47)+(1*I49))/I51
58        slope =       +Q49                                         meanY1= ((0*K47)+(1*K49))/K51
59 Eta          =       +Q61      Eta^2 = +J59^2                     ESS   = (((Q57-Q55)^2)*I51)+(((Q58-Q55)^2)*K51)
60                                                                   Eta^2 = +Q59/Q56
61                                                                   Eta   = @SQRT(Q60)

--------------------------------------------------------------------------------------------------------

@SUM & @ROUND functions are, of course, incomplete. Use the worksheet from the last article for additional information.

Formula for Asym. Lambda (cell N54) is: (@MAX(I47...I49)+@MAX(K47...K49))-@MAX(M47...M49)/(M51-@MAX(M47...M49))

       for cpd x&y -- sum of cross products (cell Q47) is:

           ((0-Q43)*(0-Q45)*I47)+((0-Q43)*(1-Q45)*K47)+((1-Q43)*(0-Q45)*I49)+((1-Q43)*(1-Q45)*K49)

For ETA^2: meanY0 = mean of Y where X = 0;  meanY1 = mean of Y where X = 1.
           TSS = Total Sum of Squares:      ESS = Explained Sum of Squares.
```

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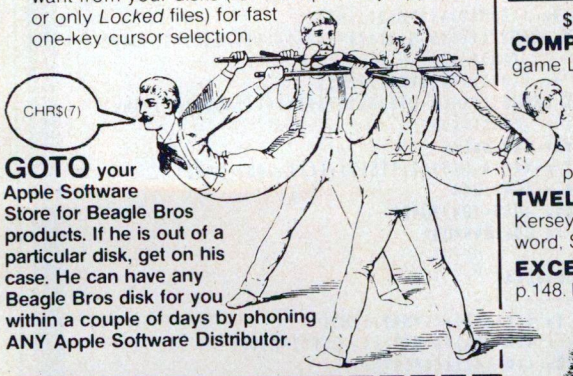

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```
10 LIST: LIST: LIST: FOR ZZ=PEEK(175)+PEEK
(176)*256+36 TO 3072: POKE ZZ,216: NEXT
20 FOR XXX=1 TO 2: POKE-16299,0: POKE
-16300,0: XXX=1: NEXT: REM Experiment
with different length variable names.
```

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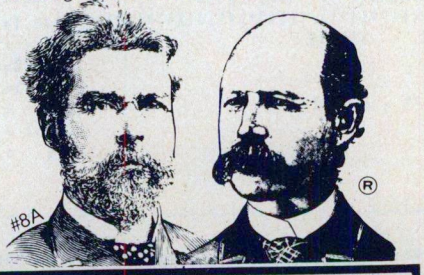

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MANY MINI-UTILITIES: Disk Scanner finds bad disk sectors, **Key-Clicker** adds subtle sound as you type, **DOS-Killer** adds two tracks of space to your disks, **2-Track Cat** allows up to 210 file names per disk, **Program Splitter** makes room for hi-res pix with large Applesoft programs, **Text Imprinter** transfers text to the hi-res screen, **Onerr Tell Me** prints the appropriate error message but continues program execution, **Text Screen Formatter** converts text layouts into Print statements... plus much more Apple wizardry from the boys at Beagle Bros.

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TWO-LINERS TOO: From our customers around the world—and elsewhere. Little mind-blowers that will teach your old Apple some new tricks!

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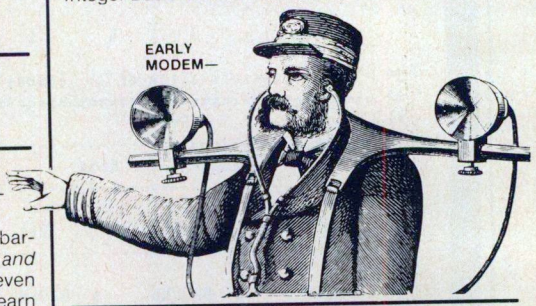
100 TIP BOOK TIPS ON DISK
by BERT KERSEY

$20.00: Includes Peeks & Pokes Chart.

100 LISTABLE PROGRAMS from Beagle Bros Tip Books 1-4. Make your Apple do things it's never done! All 100 programs are LISTable and changeable for Apple experimentation.

COMMAND CHART INCLUDED: Free with each Tip Disk; an 11 x 17 poster of all Applesoft, Integer Basic & DOS Commands with Descriptions!



FLEX TYPE

(FORMERLY "FLEX TEXT")
VARIABLE-WIDTH HI-RES TEXT UTILITY
by MARK SIMONSEN

$29.50: Includes Peeks & Pokes Chart

PRINT VARIABLE-WIDTH TEXT on both hi-res screens with normal Applesoft commands (including HTAB 1-70). Normal, expanded & compressed text with no extra hardware. (70-column text requires a monochrome monitor, not a tv).

ADD GRAPHICS TO TEXT or add Text to hi-res graphics. Run your existing Applesoft programs under Flex Type control. Fast, easy to use, and Compatible with GPLE and Double-Take.

DOS TOOL KIT® font compatibility, or use the supplied Flex Type typefaces. Select up to 9 fonts with control-key commands. A text character editor lets you redesign any Apple text character.

FRAME-UP

FAST APPLE DISPLAY UTILITY
by TOM WEISHAAR

$29.50: Includes Peeks & Pokes Chart

PROFESSIONAL PRESENTATIONS: Turn your existing Hi-Res, Lo-Res and Text frames into attractive Apple "slide shows". *FAST* hi-res loads in 2½-seconds! Paddle or Keyboard-advance frames.

UNATTENDED SHOWS are optional, with each picture arranged and pre-programmed to display on the screen from 1 to 99 seconds. Custom **Text Screen Editor** lets you create black-and-white text "slides" and add type "live" from the keyboard during shows. Mail copies of presentations on disk to your friends and associates (or home to Mom!).

AD#8A

Circle 3 on Reader Service Card

NEW!

GPLE

GLOBAL PROGRAM LINE EDITOR
by NEIL KONZEN

$49.95: Includes Peeks/Pokes Chart & Tip Book #7.

A CLASSIC APPLE PROGRAM EDITOR GPLE lets you edit Applesoft program lines *FAST* without awkward cursor-tracing and "escape editing".

INSERT & DELETE: GPLE works like a word processor for Applesoft program lines. You make changes instantly by jumping the cursor to the change point and inserting or deleting text. No need to trace to the end of a line before hitting Return.

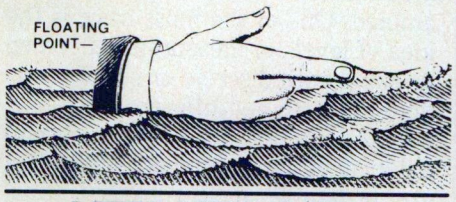
GLOBAL SEARCH & REPLACE: Find any word or variable in your programs, *FAST*. For example, find all lines containing a GOSUB, or edit or delete all lines with REM statements, or all occurrences of any variable. **Replace any variable**, word or character with any other. For example, change all X's to ABC's, or all "Horse" strings to "Cow".

80-COLUMN COMPATIBILITY: All edit & global features support **Apple IIe 80-column cards** and most 80-column cards on *any* Apple IIe, II+ or II.

DEFINABLE ESC FUNCTIONS: Define ESC plus any key to perform any task. For example, **ESC-1** can catalog drive 1, **ESC-L** can do a "HOME: LIST", **ESC-N** could type an entire subroutine... *Anything* you want, *whenever* you want.

GPLE DOS MOVER: Move DOS and GPLE to Language Card (or IIe upper 16K) for an EXTRA **10,000 Bytes** (10K) of programmable memory.

Plus APPLE TIP BOOK #7: Learn more about your Apple! Includes all new GPLE tips and tricks.



UTILITY CITY

21 PROGRAMMING UTILITIES
by BERT KERSEY

$29.50: Includes Peeks/Pokes Chart & Tip Book #3

LIST FORMATTER prints each program statement on a new line. Loops indented with printer Page Breaks. A great Applesoft program de-bugger.

MULTI-COLUMN CATALOGS, with or without sector and file codes. Organize your disk library.

INVISIBLE and trick catalog file names. Invisible functioning commands in Applesoft programs too.

MUCH MORE: 21 utilities, including auto-post Run-number & Date in programs, alphabetize/store info on disk, convert dec to hex or Int to FP, protect and append programs, dump text to printer...

LEARN PROGRAMMING: List-able programs and informative documentation. Includes Tip Book #3. Hours of good reading & Applesoft experiments.

ALPHA PLOT

HI-RES GRAPHICS/TEXT UTILITY
by BERT KERSEY and JACK CASSIDY

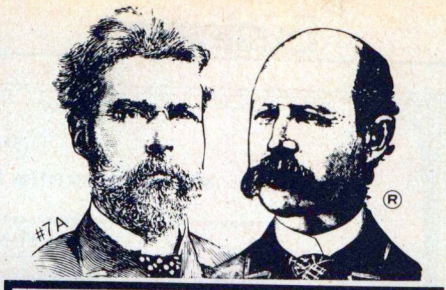
$39.50: Includes Peeks/Pokes Chart & Tip Book #4.

DRAW IN HI-RES on both Apple "pages" using easy keyboard commands OR paddles/joystick. Pre-view lines before plotting. Solid or mixed colors & Reverse (background-opposite) drawing. FAST one-keystroke circles, boxes & ellipses, filled or outlined. Add text for graphs & charts. All pix Save-able to disk, to be called from your Applesoft programs.

COMPRESS HI-RES DATA to 1/3 disk space (average) allowing more hi-res pictures per disk.

MANIPULATE IMAGES: Superimpose any two images, or RE-LOCATE any rectangular section of any drawing anywhere on either hi-res page.

HI-RES TYPE: Add text to your pictures with adjustable character-size and large-character color. Type *anywhere* with no Htab/Vtab limits. Type sideways too, for graphs. Includes Tip Book #4.



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ALL BEAGLE DISKS ARE UNLOCKED, COPYABLE AND COMPATIBLE WITH APPLE II, II+ AND IIe.*

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* DISKQUIK requires Apple IIe.
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BEAGLE BASIC

APPLESOFT ENHANCER
by MARK SIMONSEN

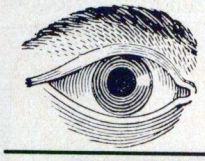
$34.95: Includes Peeks/Pokes Chart & Tip Book #6.
Requires Apple IIe (OR II/II+ with RAM Card).

RENAME ANY APPLESOFT COMMAND or Error Message to anything you want. For program clarification, encryption/protection or even foreign translation. Plus add optional NEW COMMANDS:

ELSE follows If-Then statements, like this:
IF X=2 THEN PRINT "YES": *ELSE* PRINT "NO"

HSCRN reads color of any hi-res dot for collision testing. **SWAP X,Y** exchanges 2 variables' values. New **TONE** command writes music with no messy pokes & calls. **SCRL** scrolls text in *either* direction. **TXT2** lets Text Page 2 act exactly like Page 1.

PLUS: GOTO & GOSUB may precede variables, as in "GOSUB FIX" or "GOTO 4+X". Escape-mode indicated by special ESC CURSOR. Replace awkward Graphics screen-switch pokes with 1-word commands. Change ctrl-G Beep to any tone. **INVERSE REMS** too! All GPLE compatible.



```
1 FOR S=768 TO 773: READ A:
  POKE S,A: NEXT: POKE 232,0:
  POKE 233,3: DATA 1,0,4,0,5,0
2 HGR2: FOR R=0 TO 192: ROT=R:
  SCALE=96: XDRAW 1 AT 140,95:
  SCALE=30: XDRAW 1 AT 140,95:
  S=PEEK(49200): NEXT: RUN
```

PRONTO-DOS

HIGH-SPEED DOS / DOS-MOVE UTILITY
by TOM WEISHAAR

$29.50: Includes Peeks & Pokes Chart

TRIPLES THE SPEED of disk access and frees 10,000 bytes of extra memory by moving DOS.

Function	Normal	Pronto
BLOAD HI-RES IMAGE	10 sec.	3 sec.
LOAD 60-SECTOR PROGRAM	16 sec.	4 sec.
SAVE 60-SECTOR PROGRAM	24 sec.	9 sec.
BLOAD LANGUAGE CARD	13 sec.	4 sec.
(Text Files: No Change)		

Boot the Pronto disk or your updated disks, created with the normal INIT command. Compatible with all DOS Commands, GPLE, Double-Take, DOS Boss, DiskQuik and almost all unprotected programs.

MOVE DOS to your Language Card, RAM Card, or standard Apple IIe upper 16K, freeing up **10,000 EXTRA BYTES** of memory for your programs.

15 EXTRA SECTORS per disk. Catalog Free-Space displayed every time you catalog a disk.

TYPE-COMMAND ("TYPE filename") prints contents of sequential Text Files on screen or printer.

NEW!

DISKQUIK

DISK DRIVE EMULATOR
by HARRY BRUCE and GENE HITE

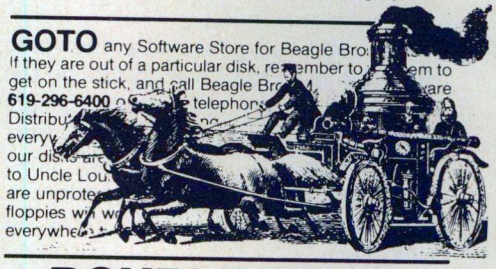
$29.50: Includes Peeks & Pokes Chart
Requires Apple IIe with Extended 80-column Card.

ACTS LIKE A DISK DRIVE in Slot 3, but much faster, quieter, more reliable and $350+ cheaper! Enjoy the benefits of a 2nd (or 3rd or 4th...) drive at less than 1/10th the price. Catalogs normally with "CATALOG, S3" command. Load & Save any kind of files into RAM with normal DOS commands.

SILENT AND FAST: Since no moving parts are involved, DiskQuik operates silently and at super-high speeds. See it to believe it. Your Apple IIe's Extended 80-column Card (required) can hold about half the amount of data as a 5¼" floppy disk!

MANY USES: For example, auto-load often-used files like FID etc., etc., into RAM when you boot up, so they are always available when you need them. Copy files from RAM onto disk and vice versa, just as if a disk drive were connected to slot #3.

FRIENDLY & COMPATIBLE with 80-column display, GPLE, ProntoDOS, and all normal Applesoft and DOS commands and procedures. Will not interfere with Apple IIe "Double Hi-Res" graphics.



DOUBLE-TAKE

2-WAY-SCROLL/MULTIPLE UTILITY
by MARK SIMONSEN

$34.95: Includes Peeks/Pokes AND Tips/Tricks Charts.

2-WAY SCROLLING: Listings & Catalogs scroll Up AND Down, making file names and program lines much easier to access. Change the Catalog or List scroll-direction at will, with Apple's Arrow keys.

80-COLUMN COMPATIBLE: All features support IIe and most other 80-column cards.

BETTER LIST FORMAT: Each program statement lists on a new line for *FAST* program tracing & de-bugging. Printer-compatible; any column-width.

VARIABLE-DISPLAY: Displays all of a program's strings and variables with current values.

CROSS-REFERENCE: Sorts and displays line numbers where each variable & string appears.

AUTO-LINE-NUMBER, Hex/Dec Converter, better Renumber/Append, Program Stats, Change Cursor, Space-On-Disk. GPLE/Pronto compatible.

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☐ Beagle Bag	29.50	☐ Silicon Salad	24.95
☐ Beagle BASIC	34.95	☐ Tip Disk #1	20.00
☐ DiskQuik	29.50	☐ Utility City	29.50
☐ DOS Boss	24.00	☐	
☐ Double-Take	34.95	☐ ADD ME to mailing list.	
☐ Flex Type	29.50	☐ ALREADY ON mail list.	

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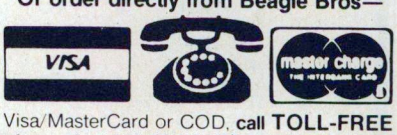
Or order directly from Beagle Bros—



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beyond using the average salary of all faculty members.

The computation of eta squared requires some additional work space. Simply compute the mean salary of the entire sample, and then compute the mean for each category of the explanatory variable. Now, compute the amount of variation about the grand mean salary (typically called Total Sum of Squares or TSS in cell Q56), the amount of variation accounted for by each category (typically called explained variation or ESS in cell Q59), and the ratio between ESS and TSS (cell Q60). This value will summarize the proportionate reduction in error when you use the category means rather than the grand mean for prediction.

In any two by two table, the value for RΛ2 and EtaΛ2 will always be the same since there are only two points with which to draw the straight line. When you use larger tables, however, RΛ2 and EtaΛ2 are typically different. Hang on to these ideas for next time.

Table 4.3 presents a complete example using faculty income and sex codes. Compare your results with mine. Then, try some other variables. You might even wish to try your own data set. Then, try to modify the formulae for working with other than 2X2 contingency tables.

Further Thoughts on Measures of Associations

This worksheet will now automatically recalculate, when you enter!, asymmetric lambda, gamma, RΛ2, and EtaΛ2. These are four of the most widely reported measures of association by data analysts. Most of these measures report values between 0 and +1 (for perfect prediction) and approach zero when either there is no association or the statistic used is inappropriate for the data being analyzed. While this worksheet will compute all these measures, it is up to you to determine which one(s) are most appropriate for your study and your data.

Speaking about data, each measure of association makes a variety of assumptions about the data being examined. One of the most basic is the idea of levels of measurement. When working with discrete or simple category data (e.g., different religions, academic major, etc.), assume nominal level of measurement. When data are orderable (e.g., degree, social class, etc.) assume the variable is measured at the ordinal level. When you know the distance between the values of the variable (e.g., age, years of employment, income, etc.), assume a metric — some say interval — level variable. Table 4.4 summarizes when to use which summary statistic, given that you know the level of measurement of the variable.

TABLE 4.4

MEASURES OF ASSOCIATION AND DATA LEVELS OF MEASUREMENT

Variable of Interest	Explanatory Variable: Nominal	Ordinal	Metric
Nominal	Lambda	Lambda	Lambda
Ordinal	Lambda	Gamma@	Gamma & RΛ2
Metric	EtaΛ2	Gamma & RΛ2	RΛ2

Notes:

Metric = interval and ratio levels.

RΛ2 = the squared value of the Pearson product moment correlation coefficient. While some people argue that RΛ2 and other parametric statistics should be reserved for variables measured at the metric level, there are many times when RΛ2 is appropriate and yields a considerable amount of useful information. So, feel free to be eclectic.

@Gamma assumes the joint distribution of the variables to be at least monotonic--i.e., the pattern in the distribution does not change direction.

TABLE 4.3

CROSSTABULATION OF INCOME BY SEX: DATA

	H	I	J	K	L	M	N	O	P	Q
39		Crosstabulation of :		Income by Sex					Comp.	Space
40										
41				Sex					Pearsonian r	
42	Income						Total			
43			Female		Male				mean Y=	.5
44									sd Y =	.51299
45			N	Pct.	N	Pct.	N	Pct.	mean X=	.5
46									sd X =	.51299
47	(=16000		6	60	4	40	10	50	cpd x&y	1
48									var X =	5.0000
49	)16000		4	40	6	60	10	50	slope =	.20000
50									intcpt=	.40000
51	Total		10	100	10	100	20	100	r =	.20000
52										
53										
54	Asym. Lambda (with Income dependent) =							.2	Eta Squared	
55	Gamma =			.384615						
56	Pearsonian r =		.2		RΛ2 =		.04		mean Y=	.5
57	intcpt=		.4						TSS =	5.0000
58	slope =		.2						meanY0=	.4
59	Eta =		.2		EtaΛ2 =		.04		meanY1=	.6
60									ESS =	.2
61									EtaΛ2 =	.04000
									Eta =	.20000

Conclusion

Contingency tables are an efficient way to summarize substantial amounts of data and present them in cogent tabular form. But, it is typically necessary to report in a statistical fashion the nature, direction and degree of association among the variables. Summary measures of association, then, are essential tools of the data analyst.

In our continuing work with this data set, sex was helpful in prediction strongly. A look at the other variables (e.g., salary with rank and salary with degree) showed rank and degree to be better predictors than sex.

Of course, our statements about these variable inter-relationships must be limited to this data set and

the population from which it was taken. But, the analytic strategy is the same for most research projects. Take a few minutes and work with this worksheet in a variety of ways. Satisfy yourself that I am telling you the truth. Indeed, if you are still skeptical about our work, go ahead and compare these results with a *SPSS* program.

This is a good time to try to develop a separate template which reports crosstab tables and summary bivariate statistics. We'll return to this idea in article 7. So go ahead and try it out.

Contingency tables are powerful tools. But, they have their limitations, too. One of the most important limitation is the loss of information and precision when you start with metric level variables (e.g., income, years of service, etc.) and collapse them into a couple of categories. Next issue, therefore, we will explore how to summarize and display bivariate relationships when working with the complete and original data values. See you then.

References

Any good introductory statistics book which covers measures of association will be of some use. Here are two useful texts:

Blalock, Hubert M. Jr. *Social Statistics: Revised Second Edition.* New York: McGraw Hill Book Co. 1979.

Mueller, John H. Karl F. Schuessler and Herbert L. Costner. *Statistical Reasoning in Sociology: Third Edition.* Boston, Mass: Houghton Mifflin Company. 1977.

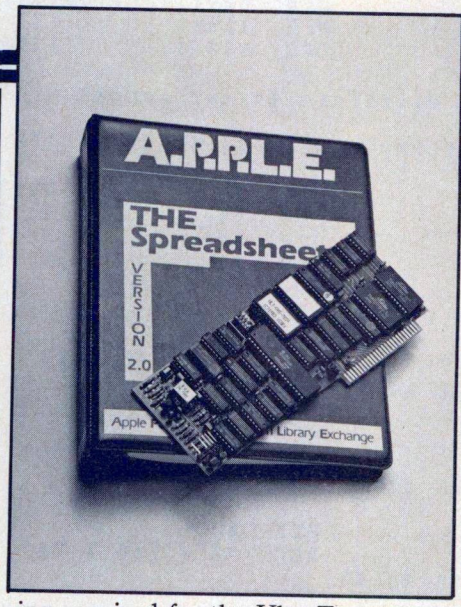
```
10  REM

      SO WHAT DID YOU
       EXPECT?

KENELM W PHILIP :

CALL-A.P.P.L.E.

20  POKE 1010,102: POKE
      1011,213: IF
      PEEK ( - 1169)
      <  > 117 THEN
       CALL  - 1169
30  HOME :Z = 2: PRINT
      "]";
40  GET A$:X =  INT
      (47 *  RND (1)
      + 161): HTAB Z:
      PRINT  CHR$ (X);:Z
      = Z + 1: IF Z
      > 38 THEN  PRINT
      :Z = 1: HTAB 1:
50  GOTO 40
```

THE Spreadsheet UltraTerm Driver

paul smith

I recently purchased the Videx UltraTerm 160 column video display board. The card allows for many different screen display formats. The standard 80 column by 24 lines is available, plus seven others, including another 80 x 24 with a high-quality character set. The 132 x 24 format can be very helpful when working with THE Spreadsheet.

When using THE Spreadsheet with the UltraTerm Card, I was a little disappointed that it supported only the standard 80 x 24 format. After reading the article "THE Spreadheet Video Terminal Driver" by Glen Ferreri in the October issue of *Call -A.P.P.L.E.*, I started thinking. If a driver can be written to use a terminal, I must be able to write a driver that will use the UltraTerm's various formats. The driver that appears here is a result of this.



Upon selecting a video driver being required for the UltraTerm card, a menu of the various formats is displayed. This allows for selection of any of the seven formats. After selecting the format desired and saving the driver, THE Spreadsheet will use the format until you change it. This has greatly enhanced THE Spreadsheet.

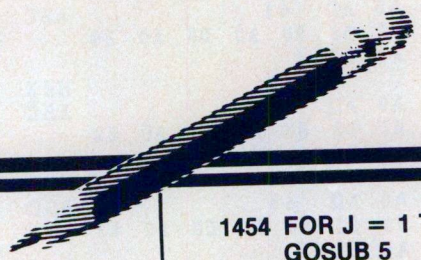
The video driver will configure THE Spreadsheet for the UltraTerm Card with its various column widths and page lengths. To use the various formats, configure THE Spreadsheet for a video driver. After loading the VIDEO.ULTRATERM driver, a display of the UltraTerm formats will appear on the screen with the current default format number. To use the default format, just hit the return key. To use a different format, enter the number corresponding to the desired format. From now on, until you change the configuration, when THE Spreadsheet is booted, it will use the UltraTerm Card with the format that you selected.

To change the format, you must first change the configuration to no video driver and return to the system menu. Then go back to the configuration menu and specify that a video driver is required. Next, load the VIDEO.ULTRATERM driver as before and specify the new format number.

```
]PR#0
: A S M
                    ********************************
                    *                              *
                    * THE Spreadsheet Video Driver *
                    *       for the UltraTerm      *
                    *                              *
                    *         by Paul Smith        *
                    *                              *
                    * Call -A.P.P.L.E. : Mar. 1984 *
                    *                              *
                    ********************************

                    HOME     =    $8C        ;Home and clear screen
                    CTRLV    =    $96        ;Ctrl-V chr
                    CSW      =    $36        ;Character output pointer
                    VIDSLOT  =    $AC7       ;UltraTerm slot #
                    KBD      =    $C000      ;Keyboard read
                    KBDSTRB                  ;Keyboard strobe
                    *
                              ORG  $1F00
                    *
1F00: 4C 9B 1F      START    JMP  START1     ;Jump to actual start

                    * THE Spreadsheet screen size
                    *
1F03: 4F            WIDTH    DFB  80-1       ;Screen width
1F04: 40            CONTROL  DFB  $40        ;Control byte
1F05: 18            LENGTH   DFB  24         ;Page length
                    *
1F06: B1            FORMAT   DFB  $B1        ;Format number
1F07: 00            FLAG     DFB  0          ;Start flag

                    * UltraTerm screen widths
                    *
1F08: 4F            WFORMAT  DFB  80-1       ;80 columns
1F09: 5F                     DFB  96-1       ;96 columns
1F0A: 9F                     DFB  160-1      ;160 columns
1F0B: 4F 4F 4F               DFB  80-1,80-1,80-1 ;80 columns
1F0E: 83                     DFB  132-1      ;132 columns
1F0F: 7F                     DFB  128-1      ;128 columns

                    * UltraTerm screen length
                    *
1F10: 18 18 18      LFORMAT  DFB  24,24,24,24 ;24 lines
1F13: 18
1F14: 20                     DFB  32         ;32 lines
1F15: 30                     DFB  48         ;48 lines
1F16: 18                     DFB  24         ;24 lines
1F17: 20                     DFB  32         ;32 lines

                    * UltraTerm formats
                    *
1F18: B1 A0 AD      STR      ASC  "1 -  80 X 24"
1F1B: A0 A0 B8 B0 A0 D8 A0 B2
1F23: B4
1F24: 8D                     HEX  8D
1F25: B2 A0 AD               ASC  "2 -  96 X 24"
1F28: A0 A0 B9 B6 A0 D8 A0 B2
1F30: B4
1F31: 8D                     HEX  8D
1F32: B3 A0 AD               ASC  "3 - 160 X 24"
1F35: A0 B1 B6 B0 A0 D8 A0 B2
1F3D: B4
1F3E: 8D                     HEX  8D
1F3F: B4 A0 AD               ASC  "4 -  80 X 24 I"
1F42: A0 A0 B8 B0 A0 D8 A0 B2
1F4A: B4 A0 C9
1F4D: 8D                     HEX  8D
1F4E: B5 A0 AD               ASC  "5 -  80 X 32 I"
1F51: A0 A0 B8 B0 A0 D8 A0 B3
1F59: B2 A0 C9
1F5C: 8D                     HEX  8D
```

```
1F5D: B6 A0 AD   61                ASC  "6 -  80 X 48 I"
1F60: A0 A0 B8 B0 A0 D8 A0 B4
1F68: B8 A0 C9
1F6B: 8D         62                HEX  8D
1F6C: B7 A0 AD   63                ASC  "7 - 132 X 24 I"
1F6F: A0 B1 B3 B2 A0 D8 A0 B2
1F77: B4 A0 C9
1F7A: 8D         64                HEX  8D
1F7B: B8 A0 AD   65                ASC  "8 - 128 X 32 I"
1F7E: A0 B1 B2 B8 A0 D8 A0 B3
1F86: B2 A0 C9
1F89: 8D 8D      66                HEX  8D8D
1F8B: C6 CF D2   67                ASC  "FORMAT NUMBER - "
1F8E: CD C1 D4 A0 CE D5 CD C2
1F96: C5 D2 A0 AD A0
                 68
                 69    *
                 70    * Actual start of driver
                 71    *
1F9B: 48         72    START1    PHA              ;Save registers
1F9C: 8A         73              TXA
1F9D: 48         74              PHA
1F9E: 98         75              TYA
1F9F: 48         76              PHA
1FA0: AD C7 0A   77              LDA  VIDSLOT     ;Gget video slot
1FA3: 09 C0      78              ORA  #$C0        ;Change to memory location
1FA5: 8D AC 1F   79              STA  INITSLOT+2  ;Set card initialization location
1FA8: A9 8C      80              LDA  #HOME       ;Initialize card and HOME cursor
1FAA: 20 00 C3   81    INITSLOT  JSR  $C300       ;Initialize video card
1FAD: AE 07 1F   82              LDX  FLAG        ;Get start flag
1FB0: D0 3A      83              BNE  DEFAULT     ;If set, don't ask format
1FB2: EE 07 1F   84              INC  FLAG        ;Set start flag
1FB5: BD 18 1F   85    DISPLAY   LDA  STR,X       ;Print UltraTerm formats
1FB8: 20 FD 1F   86              JSR  COUT
1FBB: E8         87              INX
1FBC: E0 83      88              CPX  #START1-STR
1FBE: D0 F5      89              BNE  DISPLAY
1FC0: AD 06 1F   90              LDA  FORMAT      ;Get current format number
1FC3: 20 FD 1F   91              JSR  COUT        ;Print current format number
1FC6: AD 00 C0   92    GETNUM    LDA  KBD         ;Get keyboard character
1FC9: 10 FB      93              BPL  GETNUM      ;If no character, try again
1FCB: 2C 00 80   94              BIT  KBDSTRB     ;Clear keyboard strobe
1FCE: C9 8D      95              CMP  #$8D        ;Return?
1FD0: F0 1A      96              BEQ  DEFAULT     ;Yes, use default
1FD2: C9 B1      97              CMP  #"1"        ;Less than 1?
1FD4: 90 F0      98              BCC  GETNUM      ;Yes, try again
1FD6: C9 B8      99              CMP  #"7"+1      ;Greater than 7?
1FD8: B0 EC      100             BCS  GETNUM      ;Yes, try again
1FDA: 8D 06 1F   101             STA  FORMAT      ;Save new format number
1FDD: 49 B0      102             EOR  #$B0        ;Change ASCII to hex
1FDF: AA         103             TAX
1FE0: BD 07 1F   104             LDA  WFORMAT-1,X ;Get format screen width
1FE3: 8D 03 1F   105             STA  WIDTH       ;Save screen width
1FE6: BD 0F 1F   106             LDA  LFORMAT-1,X ;Get format screen length
1FE9: 8D 05 1F   107             STA  LENGTH      ;Save screen length
1FEC: A9 96      108   DEFAULT   LDA  #CTRLV      ;Set video format lead-in
1FEE: 20 FD 1F   109             JSR  COUT
1FF1: AD 06 1F   110             LDA  FORMAT      ;Set format number
1FF4: 20 FD 1F   111             JSR  COUT
1FF7: 68         112             PLA              ;Restore registers
1FF8: A8         113             TAY
1FF9: 68         114             PLA
1FFA: AA         115             TAX
1FFB: 68         116             PLA
1FFC: 60         117             RTS
                 118
                 119   * Simulate Monitor COUT
                 120   *
1FFD: 6C 36 00   121   COUT      JMP  (CSW)       ;Indirect print

-End assembly, 256 bytes, Errors: 0
```

WRITE —A.P.P.L.E.



Versacard Interrupts

Dear Val,

I have some information that might be interesting to *Call –A.P.P.L.E.* readers of the telecommunications issue.

A few months ago, I purchased the Versacard by Prometheus (from A.P.P.L.E.) for use with my Smartmodem 1200. After getting my Source user id, I proceeded to set up ASCII Express (The Professional) with a macro file to logon to the Source. Everything worked fine at 300 baud but failed to work at 1200 baud. I was losing the first two characters of every line and dropping characters throughout the lines received from the Source. With the flexible features of ASCII Express macros, I was able to sign on at 1200 baud, but the received data was garbled.

Since I had just updated to the new version of ASCII Express, I gave the publisher, Southwestern Data Systems, a quick call. I soon learned that the support number in the manual was incorrect, and was given a new number (619 592–9112). After calling the new number, the discussion led to speculation that the serial board was not generating interrupts. With that in mind, I then called Prometheus Technical Support.

After presenting my problem, I was informed that I must have an additional jumper closed in order to use interrupts for the serial board operation. The interrupt section of the ASCII Express documentation indicates that the Versacard is fully configured and ready to use with interrupts (page 278 of the new manual). Not true. Page 20 of the Versacard documentation indicates that jumper J1 must be left closed (as delivered) in order for interrupts to work.

However, in order to use interrupts on the Versacard, you must also place a jumper on JH4, which is located just above chip U17 (the 6850 UART). My card did not come with a spare jumper for this purpose, so I had to wing it, but it did solve the problem. I am now able to use ASCII Express to communicate at 1200 baud with the Source.

While attempting to resolve the problem with interrupts, I entered the clock display driver program from the Versacard documentation. It would not work either. It turns out that general interrupts also require the jumper on JH4 (the interrupt rate is selected by JH1). Do not use the high speed rate (1024 per second) for the clock display driver. Everything else on your Apple will almost stop.

The documentation only mentioned jumpers for J1 and JH1, which were already in place. This was an interesting experience, but one that was unnecessary. The documentation also provides a short assembly language program to read and test the 6850 UART status byte (on pages 42–43; LOAD $C084 + $n0 where n = slot#). It uses ROL to shift bit 0 or bit 1 into the CARRY flag. This should be changed to ROR (rotate right once for bit 0, twice for bit 1). Also, location $778 does not contain $n0. I had to use location $7F8 which contains $Cn in order to get the active slot number.

Outside of these difficulties, the Versacard works beautifully with the Smartmodem 1200 at 300 baud and 1200 baud. The clock works great with ProDOS, and I am very satisfied with the product. It just needs better documentation.

Ken Kashmarek
6 Cherokee Ct. RR2
Eldridge, IA 52748

Sorting Magfiler Out

Dear Editor,

I am a satisfied user of the Magfiler program by Jack Olivieri, which was published in the May 1983 issue. However, I find the sort module quite slow and I wondered whether it could be speeded–up a bit.

Well, it can. RUNning the program after issuing a MONC command reveals that each time a record is being read or written, the file accessed is opened first, which is a tremendous loss of time: the file should be opened only once to enable the program to read or write a whole bunch of records.

I modified the program in the following way:

```
LOAD MAGFILER
1443 PRINT D$"OPEN"NA$I",L65"
1446
1453 PRINT D$"OPEN"NA$I",L65"
1454 FOR J = 1 TO M%(I):
     GOSUB 5
UNLOCK MAGFILER
SAVE MAGFILER
LOCK MAGFILER
```

This modification will make the sort module run at least five times faster. I hope someone will be able to use this information.

Jan Ceuleers
Van Erstenstraat 123
B–2100 Antwerpen (Deurne)
Belgium

"C," the Comments

Dear Val,

I was pleased to read the two–part series of articles you ran on the C programming language. Apparently, after several years, C is a language whose time has come.

It seems some software firms have jumped on the C bandwagon earlier than others. For example, Microsoft does a good deal of development in C (in addition to publishing a C compiler for some 16–bit machines). Obviously Manx uses C, as does Mark of the Unicorn.

Aztec C is a very good implementation, and runs extremely well on the Apple][. I have been using it for several applications that are inaccessible from Applesoft and inappropriate for Pascal or Modula–2.

I agree that the C programming language is conceptually far more difficult to grasp than BASIC, but I do not feel it is a language by experts, exclusively for experts. One of the advantages of C is that it imposes more discipline than BASIC without giving one the feeling that "big brother is watching your programming structure" like Pascal.

The conceptual complexities of C are a bit staggering at first, but as you move on to applications that are less casual, requiring complex data structures, recursion, flexible I/O, or low–level machine access, C is a natural. It makes such algorithms concise to implement, and often extremely efficient in their use of the machine. The hoops one must jump to perform recursion in Applesoft, as pointed out by Cornelis Bongers' fine article, "The Earl of Varspace," are extraordinary, and in my opinion, undesirable.

C is also quite a good insurance policy against obsolescence, as there is a C implementation very much like Aztec C II on the Commodore, IBM, and several other microcomputers. Since the computer hardware seems to evolve far faster than truly good new ideas in software, a "portable" language like C can be the software developer's way of protecting his or her effort.

Regarding the "bugs" in Aztec C II, I have a later release than did your reviewer, and the interpreter (CCI) works fine. There are a few peculiarities, and several out and out bugs, but they are recognizable, and easy to work around.

I recommend C to the serious programmer, but I strongly advise those who grow impatient for immediate results to hold off because the Aztec C compiler is so slow that I often wonder if it has gone on a siesta (I've been known to press reset more often than once). There are stories floating around about a C programmer who started a compile, then went out for a three course dinner. When he returned, the compile was almost done! I can only claim that the compiler takes longer to clank through one of my programs than it does to run out of hot water in my shower.

Several other potentially bright lights in the portable languages field are:

Modula-2, currently implemented by Volition Systems for the Z-80, 6502, 8086/8088, and 68000 (and perhaps more — who knows)

Turbo Pascal, which runs on several machines, including the Apple][and IBM PC.

Apparently, the issue of mature, portable code has reached some degree of fruition in the micro market!

Steve Ross
1529 1st Ave W.
Seattle, WA 98119

Telecommunications Security

from p. 28

With a little study, this program should be easy for you to understand. It uses most of the same principles of the earlier programs. Note that line 40 and 50 print a message and then underlines the message, to inform the user what is happening. Study line 70 carefully to see how the program prints "S$(N)" as N increases. The trick is the placement of the quotes and semi-colons.

Lines 140 to 160 print the strings you have entered. They may be omitted if desired, but I like to see what strings I typed. Lines 170 to 190 also print informational messages and lines 210 to 270 do the work of writing the text to a CODEFILE.

Save to your disk with the name, "ENTER CODE," and now you will be able to type in strings that you have received in a hard copy form. The program will create a textfile with the name of, "CODEFILE" and can be decoded with the program "DECODE"! If you make any errors while typing the strings, simply use the left arrow key to correct prior to hitting the Return key.

It is also very practical to keep data in an encoded form for your own use. In this way your own files re-

Continued P. 50

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Circle 20 on Reader Service Card

Eamon Contest Winners

bet you thought you'd never see this one in print

donald brown
michael thyng

IN our December 1982 issue, we invited you to create an EAMON Adventure and turn it in for world-wide recognition — and possibly an award. The originator of EAMON, Don Brown, agreed to act as contest judge whose sole decision would determine the outcome of the contest. In December we told you "...it might be quite some time after February 28th before we know who the winner is. Because of that we can't tell you exactly when the winner will be announced." Well, the time has arrived when further procrastination is useless, thus you will find herein comments from Don's letter explaining who, what and why. Read on.

A few of you "old-timers" may remember a contest that A.P.P.L.E. ran a few months ago, where club members designed adventures for the Wonderful World of Eamon series, and I was to pick a winner. Some of you may have wondered what the results were, and what was taking so long. (Had I been hit by a truck, fallen off a cliff, or bought into Osborne Computer Company??) Well, you see, I did receive the dungeons on time, and judged them in somewhat reasonable order. I then made the fatal mistake of sending the results to A.P.P.L.E. by U.S. Snail. Seven months later, when I received a call asking what the delay was, my copy was of course nowhere to be found, and the judging process had to begin again.

Anyway, in spite of the best efforts of Murphy and Finagle, here are the final results. Remember that judging a contest like this is a very subjective process, relying on my personal whims and tastes, and these rankings should not be taken as the absolute word on anything. So without further waffling, here are the results:

The Winner: The Feast of Carroll
Close Second: The Master's Dungeon
Very Honorable Mention: Crystal Mountain, The Lost Adventure, and The Manxome Foe.

In judging the contest, I tried to look at the following points —

1) Believability.

Yes, in fantasy you can create as outrageous a world as you like, but it has to remain consistent. Although I was constantly surprised in the winning adventures, I never thought to myself "This is silly, this can't be happening."

2) Imagery.

The potential advantage of text adventures is that they can create far more vivid pictures in your mind than a graphic adventure can draw on your screen. It is up to the author to realize that advantage through the words he or she chooses.

3) Strategic value.

I personally do not like the type of adventure referred to as "hack and slash," where you charge down the hallways, killing all you encounter. There is a need for puzzles. Another aspect of strategic value concerns the fairness of traps. Too many adventures have "zap you're dead" traps, which kill you unless you (a) know the trap is there by having encountered it before, and (b) know the single, exact way out which you determine by having the other reasonable choices fail.

4) Fun and humor.

This is, of course, the most subjective question of them all. I want to have fun when I play games, and what I find fun may differ from others ideas. However, the main things I find enjoyable are (a) visibly making progress toward a goal, (b) seeing my cleverness pay off, and (c) puns. This was the overriding factor that lead me to pick the winning adventures.

Our winner is a co-authored entry, "The Feast of Carroll." It was written by Daniel R. Lilienkamp and Jonathan A. Lilienkamp from St. Louis, MO. They win the first prize of $250 worth of club merchandise.

Second place goes to Jeff Seeck of Itasca, Illinois. His entry, "The Master's Dungeon" gives him an award of $100 worth of A.P.P.L.E. products.

The three honorable mention entries will each get a $50 credit toward future club purchases. "Crystal Mountain" was written by Ken Hoffman of Seattle, WA. "The Lost Adventure" was written by Jeff Seeck of Itasca, IL. "The Manxome Foe" was written by Ray Olszewski of Menlo Park, CA.

All entries are available for purchase through A.P.P.L.E. in the "As-is" software products section. The entries that were submitted, but didn't win prizes are called:

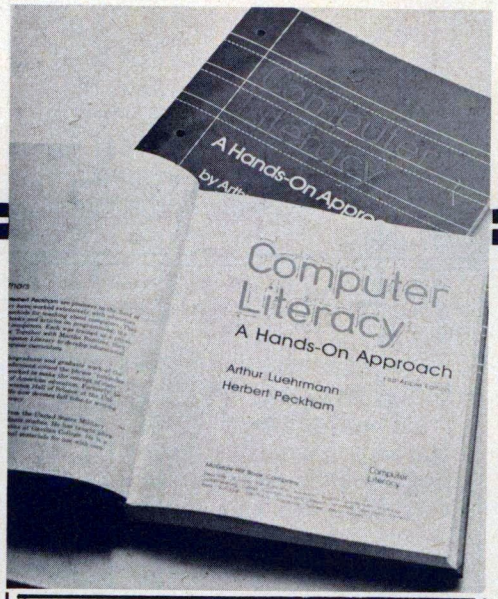
Behind the Sealed Door
by Tim Berge
The Land of Death
by Tim Berge
Jungles of Vietnam
by Jeff Seeck
Sewers of Chicago
by Jeff Seeck
The Black Castle of Nagog
by Doug Burrows
Castle of Doom
by Matthew D. Mullin
Valkenburg Castle
by Jeff Weener
Modern Problems
by Bonnie Anderson, Tony Barban and Jay Thompson

While it was not possible for all entries to receive prizes, they all exhibited a calibre of imagination and programming touted by A.P.P.L.E. They have been added to our collection of public domain disks and are worthy of your consideration. (At five bucks a crack, who can complain?)

A CALL –A.P.P.L.E. BOOK REVIEW

Computer Literacy

eric flescher



Computer Literacy: A Hands On Approach
Arthur Leuhrmann and Herbert Peckham
McGraw Hill Book Company

IF you look in any educational product catalog, or search through a bookstore, you will find a multitude of books dealing with computers, computer education and literacy. Many of these books deal with teaching or learning about computers, languages, and methods to utilize the devices in a variety of ways. For the most part, these books do not deal with a major problem involving their utilization in the schools today: the lack of computer curriculum which educators can use to help students become "computer literate." A book which appropriately addresses this problem is *Computer Literacy,* which includes a textbook, Teacher's Guide and accompanying diskette.

Many computer books are written by non–educators. This book has been written in conjunction with teachers, computer educators and noted computer specialists, which has helped to develop an easily read format and style. Educators and students, computer novices, intermediates or experts, should find this book useful.

The guide suggests that the book is written as a model for a one semester computer literacy course, for grades 7 through adult. Because advanced math is not a prerequisite, I feel that educators may find it useful for short minicourses or regular class use in grades K–6 as well.

The guide, a valuable addition to the text, should be read first. The introduction emphasizes the nature of the book and the curriculum: Hands–on approach, practical, machine–specific, and emphasis on insight (discovery), as a means of learning. Other pages give advice on course materials, computer requirements, organization of content, and organization of the textbook.

The next two sections, "Getting Started" and "Teaching Tactics," provide — on a multitude of questions — helpful hints, techniques and advice which may be useful to any educator. More importantly, the book covers the disadvantages, advantages and management processes that various educators want to use, dependent upon their particular educational situation. These are valuable and significant sections.

The authors have recognized that many teachers may be constrained, due to the small number of computers available to them, may be uncomfortable with computers, or need to use different means to guide their students. Possible remedies to these situations are given. These include sample daily activity plans, tips on effective use of memory, use of diskettes, teaching hints and more. Overviews of chapters in the text, and sample tests are also included to assist the educator. A section on computer resources, Apple secrets and program listings follow. Educators may want to review these sections, depending on their individual needs. One needn't go in order, but an educator may eventually want to browse all parts of the book.

The textbook, itself, is divided into nine parts, each emphasizing different computer related themes. These blend together during course progress. The scope and sequence chart (pages xii and xiii), highlight some of these interrelated topics that appear throughout the text. Educators may want to use these sections as special reviews, minicourses, or as a way to specialize their courses. The text attempts to portray, as it should, different and individualized approach methods to guide teachers in their course development.

The style in which the text is written may be suitable for most classroom teachers and students. Others may want or need more creative, and less structured approaches. The text covers a wide variety of topics, commands and content related information. Sample questions, new word sections, new ideas and exploration idea sections, help in formulating a total curriculum approach. Good illustrations highlight techniques and questions along the way assist in concept development. Topics such as computers and people, impact and use of computers are infused within the text to highlight the wide encompassing nature of the computer revolution. It is to the authors credit that they have used these as integral parts of the text.

The text covers a wide array of commands. You are instructed in graphics, BASIC language and operational commands, many of which are reinforced with helpful illustrations, highlighted key words and phrases, and mini–exercises.

I believe many educators will find this text useful, especially in getting started with computers in your school. Non–educators may find it useful for enriching their own knowledge of computers, or for teaching their children. In my districts, the text is used at the junior high level, although not as much as at the high

school level. The book is well suited for the lower grades because of the slow, methodical, test oriented approach. This follows the "normal" approach followed in most courses. However, at the secondary level and at the lower grades possibly, many students are prepared and thrive on a project-oriented, hands on approach, in which students explore in different directions. This approach, recommended by Seymour Papert, Patrick Suppes, Alfred Bork and other noted computer specialists may not fit into this text/curriculum without modification.

Many students will come into a class knowing more than this book's whole contents, or will be prepared to learn at a faster pace. The teacher should individualize for these students and find additional approaches.

I would recommend that educators take a computer course on their own before implementing courses. Many teachers will not know how to individualize or supplement a computer course without first providing for their own background. Those educators who do so may gain better insights, with or without this book. The text is commendable and can help guide you in developing computer use in the classroom. Don't let it constrain you, as I'm sure its authors did not have this intention.

Telecommunications Security

from p. 47

main known only to you as long as the encoding and decoding programs remain your secret. It is also very easy to mail a disk with some encoded text file on it to someone and have them run the decoding program and read the data in your file. Just do not include the encoding program and decoding program on the same disk. This can be done, by running the programs and then using FID to transfer the encoded text file to the disk you wish to mail or keep for your own records.

In summary, these programs are very easy to use, are practically fool proof and will code and later decode text in a manner that is entirely controlled by the computer and they are very fast. This should eliminate the chores involved in these processes. In addition, the encoded text should be almost impossible to decipher in a reasonable period of time by anyone short of an extremely sophisticated cryptographer. Perhaps the encoding and decoding of data will make the sending of data by modem or letter, or the keeping of data, a much more private matter. Let us hope so.

```
10  REM
SO WHAT DID YOU EXPECT?


MICHAEL ZIOBER : CALL
      -A.P.P.L.E.

20  READ X: IF X THEN
      Y = Y + X:Z =
      Z + 1: PRINT
      CHR$ ( PEEK (Y)
      - Z):: GOTO 20
30  DATA 53442,354,-418,4096
      ,-3927,-62,3989,-3228,
      -699,6,-93,1498,4581,-
      4104,-2027,-150,251,-1
      95,2968,-2409,-409,-15
      0,195,0
```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4. **DUMP Memory to screen/printer in Hex with Ascii on right side.**
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7. **HIDOS moves DOS to Language Card & continues operation of program.**
8. **/ is a one keystroke Catalog in addition to the original command.**
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10. **FIND prints address's of hex found in 64k memory. Hidos cmd only.**

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All times in seconds. (Time Test programs available)		DAVID DOS-II	ProDOS	DIVERSI DOS	DOS 3.3
TEXTFILES (100 Sectors)	TSAVE	8.0	NO	NO	NO
	TLOAD	6.2	NO	NO	NO
(791 Strings, 32 chars ea)	WRITE	29.3	28.0	29.4	88.4
	READ	24.3	16.3	24.3	83.8
	PRINT/READ	44.2	45.9	45.1	117.1
(442 Sectors, 7 x 500)	APPEND	142.3	142.9	151.1	1231.2
APPLESOFT (100 Sectors)	*SAVE	7.1	16.4	6.4	33.1
	LOAD	5.0	4.0	5.0	23.5
INTEGER (100 Sectors)	*SAVE	7.3	NO	6.6	33.4
	LOAD	4.9	NO	4.9	23.4
BINARY (100 Sectors)	*BSAVE	7.8	18.4	7.3	28.7
	BLOAD	5.8	4.8	5.8	24.5
48K PROGRAM SPACE	APPLESOFT	36,352	NO	36,352	36,352
(With 3 Bufs avail)	INTEGER	36,352	NO	36,352	36,352
	BINARY	36,352	34,816	36,352	36,352
64K PROGRAM SPACE	APPLESOFT	46,592	31,232	45,658	35,162
(With 5 Bufs avail)	INTEGER	46,592	NO	35,162	35,162
	BINARY	46,592	40,704	45,658	35,162
NUMBER OF DOS COMMANDS		37	29	31	28
CLOCK FILE DATING		YES	YES	NO	NO
MANUAL FILE DATING		YES	NO	NO	NO
ONE KEYSTROKE CATALOG		YES	NO	YES	NO
AUTO USE INTEGER CARD ANY SLOT		YES	NO	NO	NO

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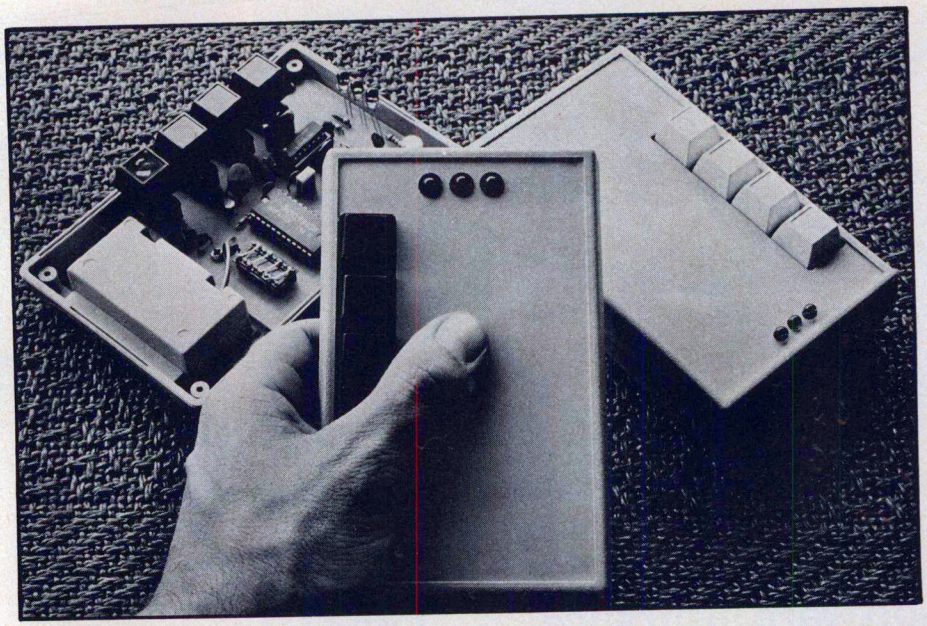
Infra-Red Remote Controls in the Classroom



robert zimmerer

ALMOST everybody is now aware of the use of remote control TV tuning. The mute button alone is worth the cost of remote control. The first such remote controllers used acoustic coupling between the hand-held control and the TV. The transmission was by a series of supersonic pulses inaudible to humans. Today the coupling is via infrared light [hereafter IR] invisible to humans. Transmission is by a series of IR light pulses. What has made this possible is the low cost of high-output Light Emitting Diodes (LED) and high sensitivity IR sensors. With these necessary components at hand, integrated circuit manufacturers have designed complex support chips to implement a variety of transmission protocols.

We are entering a new era of IR remote control, with special emphasis on data entry and computer control. The Japanese are using IR data links for cable-less interconnection between office computers. American Bell is using IR on their VIDEOTEX so that the keyboard is literally wireless. Certainly one of the biggest applications will be to completely free the computer keyboard of its tether, the flexible cable presently required to connect it to the computer. The IBM PC/jr is the first such microcomputer to offer a wireless keyboard. What I shall describe here is a system of multiple remote hand-held controls which enable several people (or in my case, students), to enter data into the same Apple computer.

Why use IR Remote Control?

The idea behind this IR remote data entry system is to allow a group of students to respond individually and privately to multiple choice questions and have the computer analyze their answers. This can be an asset for teachers, relieving them of the paper work usually involved. This same system would also permit multiple player games. Each player holds a wireless IR responder which he uses to enter his "move."

The hardware makes use of a pair of Texas Instruments integrated circuits specifically manufactured for IR remote control. The transmitter chip permits 128 unique 7-bit words to be used. I apportioned these 128 unique words among 32 individual hand held responders so that each responder had four unique words. In this way, 32 students could choose one of four replies to a question and the computer would be able to distinguish their answers.

The receiver chip contains both amplifiers and a demodulator which reconstructs the transmitted 7-bit word. This serial word is first converted to a parallel word, then read by the computer. A software routine then determines which student replied and which of the four choices he made. This information becomes the basis of subsequent analysis to suit the teacher's requirements.

Construction

My hand held responders are packaged in plastic boxes manufactured by Pac-Tec and sometimes sold in Radio Shack stores. This attractive box has a 9 volt battery compartment. A circuit board was laid out to fit the box. There are three IR LEDs in the forward end and four push-buttons to provide the one-of-four response. Because of the low battery drain, nearly zero when not transmitting, no on-off switch is provided. The TI transmitter chip does everything! It comes to life when a button is pushed, decodes the keyboard, formats a serial 7-bit word, and repeats the transmission at 75 ms intervals as long as the button is pressed.

It was necessary to inhibit repeated transmissions in my schoolroom application because there are

many transmitters to be "heard." A CMOS chip was added to the normal circuit to accomplish this. Thus, upon pressing a button, a single 7-bit word of 25 ms duration is transmitted, and the push-button is locked out for about one second to prevent one responder from monopolizing transmissions.

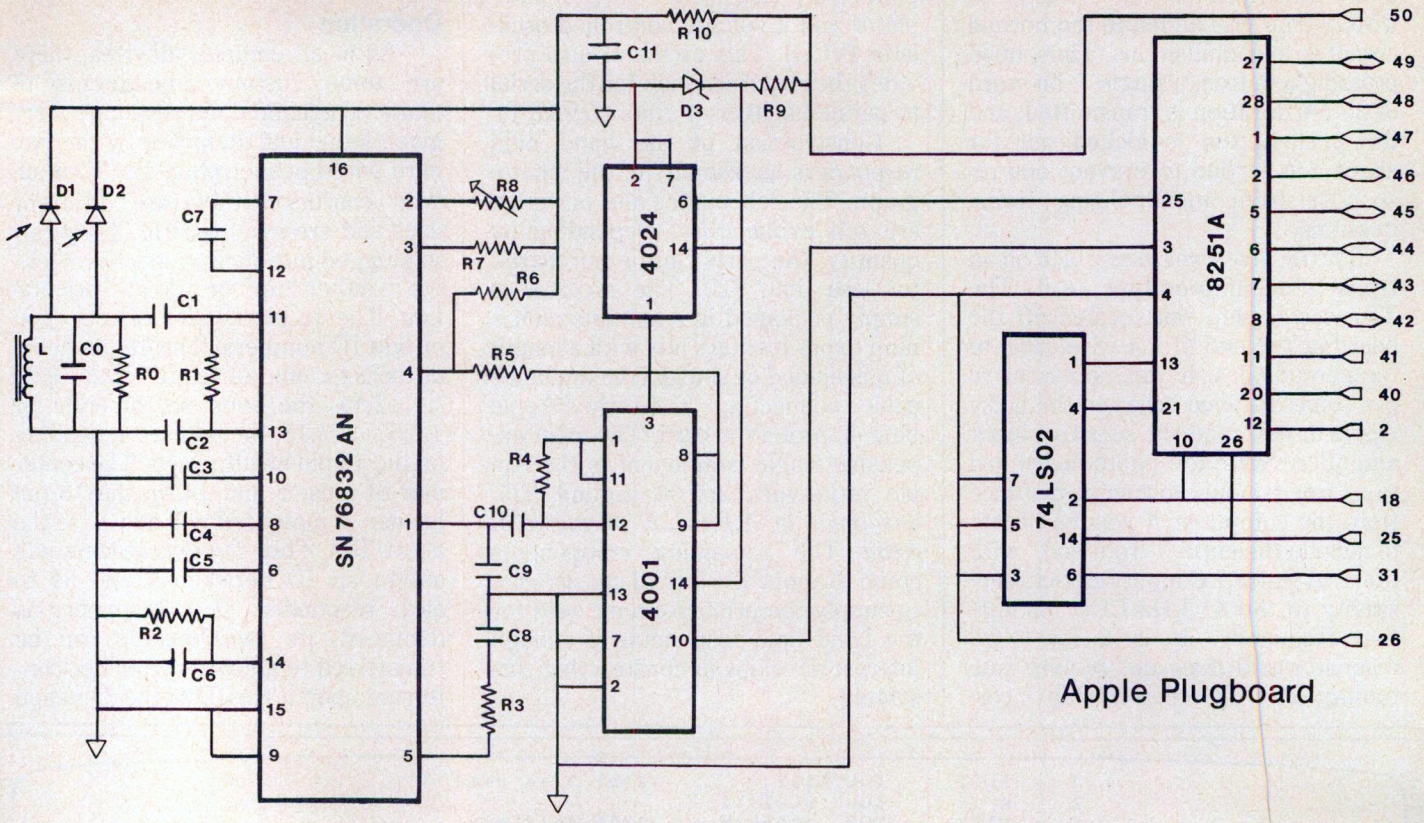
The receiver was assembled on an Apple plug-in prototype card. The TI receiver chip was located off the board at the end of a 4-wire cable to the photodiodes. It was necessary to put some distance between the noisy Apple interior and the sensitive input amplifier. Since the photodiodes had to be freely mountable some distance from the computer, it was no bother to include the entire "front end" with them. A tuned LC input restricts sensitivity to the 41 kHz LED modulation frequency. It is a low "Q" resonator and does not require fine tuning. The TI receiver chip incorporates a phase-locked-loop demodulator and a voltage controlled oscillator (VCO). This oscillator also provides the required clock for the serial to parallel converter chip. (USART)

Construction of the hand held responders is shown in the photograph. The schematics and parts list are self explanatory. Depending on quantity, the parts can be purchased for less than $20. The receiver is simply packaged in a suitable aluminum experimenters box with a length of unshielded or shielded 4 conductor cable connecting it to the Apple plug-in prototype card. The most expensive single component is the Apple prototype card at around $25. (*Available to A.P.P.L.E. members at $15.)* The remaining components come to about $25 total. I can arrange to supply the printed circuit card for the hand held responders if enough interest develops in constructing this system.

Operation

As in all complex devices, there are some custom adjustments to make. The hand-held responders are given individual identities by the two hard wired header plug-ins. To minimize confusion they are different sizes and are symmetrical. They can be plugged into their respective sockets in either "up" or "down" orientation. The 16 pin header selects even or odd ID numbers. The 18 pin header selects one of eight IDs: 0,2,4 . . .12,14, the even set of eight or 1,3,5. . .13,15, the odd set depending on the 16 pin header used. The center pair of pins, 5 and 14 on the 18 pin header, if jumpered will add 16 to the above IDs. Thus the two headers will assign an ID between 0 and 31 to each responder. If a responder is damaged, its two headers can be transferred to a spare responder conferring upon it the ID of the damaged

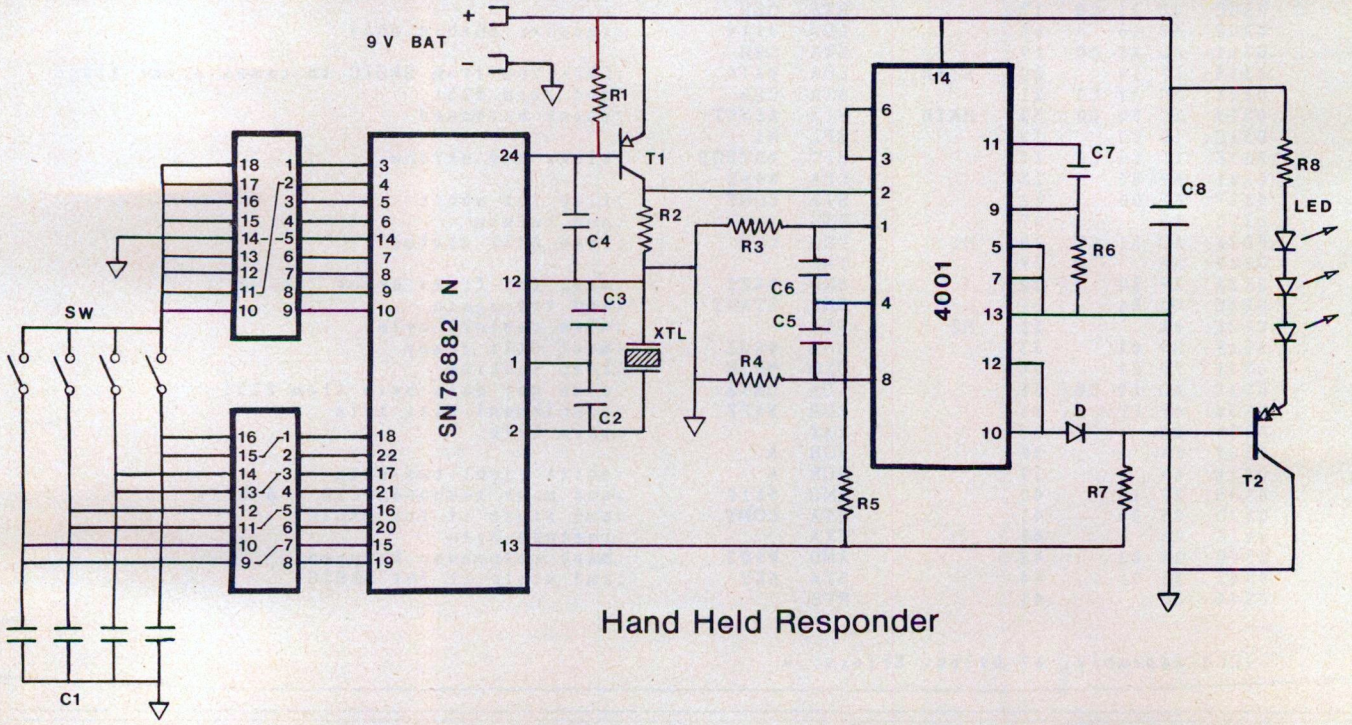
```
                        1    SLOT     EQU  $02          ;slot 2 is used
                        2    N        EQU  SLOT*16
                        3    DATA     EQU  $C080+N      ;8251 data port
                        4    CSR      EQU  $C081+N      ;8251 status and control port
                        5    KEYST    EQU  $C000        ;Apple keyboard status
                        6    KSTROB   EQU  $C010        ;Apple keyboard strobe
                        7    CONT     EQU  $0           ;responder ID storage
                        8    KEY      EQU  $1           ;responder keypress storage
                        9
                        10            ORG  $300         ;768 decimal
                        11
0300: A9 BE             12   SETUP    LDA  #$BE         ;CALL 768 from BASIC to initialize 8251
0302: 8D A1 C0          13            STA  CSR
0305: A9 40             14            LDA  #$40         ;reset byte
0307: 8D A1 C0          15            STA  CSR
030A: A9 4E             16            LDA  #$4E         ;8 bits, no parity, one stop bit, 16X clock
030C: 8D A1 C0          17            STA  CSR
030F: A9 14             18            LDA  #$14         ;receive enable only
0311: 8D A1 C0          19            STA  CSR
0314: A9 14             20   START    LDA  #$14         ;CALL 788 from BASIC to reset error flags
0316: 8D A1 C0          21            STA  CSR          ;and read 8251
0319: 2C 00 C0          22   MAIN     BIT  KEYST        ;check keyboard
031C: 10 08             23            BPL  M1
031E: 2C 10 C0          24            BIT  KSTROB       ;clear key strobe
0321: A9 80             25            LDA  #$80
0323: 85 00             26            STA  CONT         ;flag for abort
0325: 60                27            RTS               ;and return
0326: AD A1 C0          28   M1       LDA  CSR          ;read 8251 status
0329: AA                29            TAX
032A: 29 20             30            AND  #$20         ;mask for frame error
032C: D0 E6             31            BNE  START        ;and try again
032E: 8A                32   M2       TXA               ;else restore byte
032F: 29 02             33            AND  #$02         ;mask data ready
0331: F0 E6             34            BEQ  MAIN         ;keep looking
0333: AD A0 C0          35            LDA  DATA         ;else get data byte from 8251
0336: 49 FF             36            EOR  #$FF         ;complement data byte
0338: AA                37            TAX               ;save byte
0339: 6A                38            ROR  A
033A: 6A                39            ROR  A            ;shift right two bits
033B: 29 1F             40            AND  #$1F         ;and mask responder ID - 5 bits
033D: 85 00             41            STA  CONT         ;and store it for BASIC
033F: 8A                42            TXA               ;restore byte
0340: 29 03             43            AND  #$03         ;mask responder keypress
0342: 85 01             44            STA  KEY          ;and store it for BASIC
0344: 60                45            RTS

--End assembly, 69 bytes. Errors: 0
```



responder. This allows rapid classroom repair by a teacher.

The quiescent current drain on the 9 volt battery is very low, about 0.25 microamps and due mostly to the leakage of the large 100 mF capacitor. The 22 ma operating current flows less than 0.1 second after one of the four buttons is pressed. To maximize battery life it can be removed from the responder when it is not in use, an easy operation.

There is a single one-time adjustment which must be made. R8 is a 25K trimpot which should be set to maximum during assembly. It sets the center frequency of the phaselock VCO. To adjust it, a responder is



Hand Held Responder

pointed at the receiver at a range of a few feet to insure that a strong signal will be present in the receiver. The CMOS 4001 should be removed from the responder so that it will transmit continuously while a button is pressed. This will cause the Apple monitor to show a repeating response which scrolls across the screen. R8 is adjusted to provide optimum sensitivity.

While pressing a responder button, decrease R8 until the Apple monitor shows a response. Then try pointing the responder away from the receiver moving it slowly. Readjust R8 to try to maintain a response on the monitor. The optimum setting of R8 will allow the weakest signal from the responder to produce a correct monitor display.

For more precise adjustment of R8, an oscilloscope should be used to monitor pin 10 of the 4001 which is the buttered output from pin 4 of the TI chip. Other helpful monitor points are pin 14 of the TI chip which reveals the performance of the phase-lock loop and pin 1, the VCO output. This output is buffered by the 4001 which then drives the 4024 frequency divider to produce the 16X clock for pin 25 of the 8251 USART.

Possible trouble can arise from the LC tuned input. Variation in component values of L and C0 may alter the center frequency which should be about 41 KHz. This can decrease sensitivity or increase sensitivity. Due to noise, too much sensitivity can be counterproductive. In addition, R2 and R0 play a role in this. For a complete discussion, read the TI Application Note *Infrared Remote Control with TI Products,* SGDA001, by Robert E. Smith.

```
10  HOME
20  INPUT "WHO IS #0
      ?";A$: REM  :
      REQUEST NAMES
      FOR EACH OF 4
      RESPONDER IDS

30  INPUT "WHO IS #1
      ?";B$
40  INPUT "WHO IS #2
      ?";C$
50  INPUT "WHO IS #3
      ?";D$
60  PRINT "STUDENT","RESPONS
      E":: REM    SET
      UP COLUMN HEADINGS
70  CALL 768: REM
      INITIALIZE 8251
80  CALL 788: REM
      READ 8251
90 S =  PEEK (0): REM
            GET RESPONDER
      ID
100  IF S = 128 GOTO
      1000: REM   IF
      ANY APPLE KEYPRESS
      RETURN TO BASIC
110 S$ = "ERROR"
120 A =  PEEK (1): REM
            GET RESPONDER
      KEYPRESS
130  IF S = 0 THEN S$
      = "     " + A$:
      REM   FORMAT RESPONSE
      FOR TV
140  IF S = 1 THEN S$
      = "    " + B$
150  IF S = 2 THEN S$
      = "   " + C$
160  IF S = 3 THEN S$
      = D$: REM   IF
      NONE OF THESE
      THEN PRINT ERROR
170  PRINT S$,A
180  PRINT
190  GOTO 80
200  PRINT "PROGRAM
      ABORTED"
```

Note

The direct line of sight between LEDs and receiver photo diodes can be 20 feet when pointing at each other. At closer distances the transmitted signal can be bounced off a white ceiling into the receiver which also points at the ceiling.

Apple Connection

The 8251 USART is addressed at $C080 + N for data and at $C081 + N for status/control. N is 16*(slot number). In the software presented here for a minimum system, a machine code routine is given to initialize the 8251 and to read it. These two routines are called from a BASIC program. The serial output from the TI receiver chip begins with a start bit which is high and mark bits which are low, the inverse of what the 8251 requires. The 4001 buffer inverts this serial data so that start and marking bits are proper for the 8251. To recover the data bits, the output byte from the 8251 is complemented. Because the TI transmitter chip formats an 8-bit word with the first bit used as a start bit, only seven bits are meaningful. Since the 8251 sees the inverted serial signal, the marking bits become defacto stop bits and all is well! The eighth bit from the 8251 must be zero in this scheme. This read routine only checks for frame errors. More elaborate checks could be used to ensure the eighth bit is zero, for example, reducing errors from overlapping responders.

Parts List — Hand Held Responder

Resistors	all 1/4 watt carbon composition or film
1.2K	R1
12K	R2, R4, R5, R7
8.2Meg	R3
5.6Meg	R6
27K	R8

Capacitors

220	pF	C1, C2, C3, C5
0.1	MF	C4
0.22	MF	C6
0.033	MF	C7
100	MF	C8

Other Components

D	IN914 type diode
XTL	455 kHz ceramic resonator, Radio Shack CSB 455E
T1	PNP transistor like 2N4403
T2	Motorola darlington MPS A63
CD4001	CMOS quad 2-input NOR gate
SN76882N	Transmitter chip by TI
LED (3 ea)	TIL 906-2 by TI
Sockets	DIP 14, 16, 18, 24 pin
SW	4 — Stackpole 77-8000 (Mouse Electronics)
BOX	Pac-Tec #60-360, Radio Shack 270-219

9 volt battery and snap connector

Parts List — Receiver

Resistors	1/4 watt carbon composition or film
56K	R0
120K	R1, R2, R5
560	R3, R9
1.2Meg	R4
12K	R6, R7
25K	R8 (trimpot)
39	R10

Capacitors

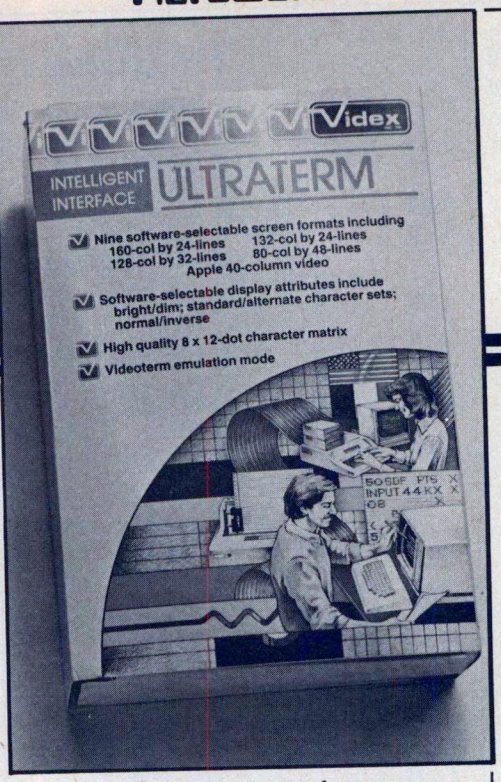
100	pF	C0 (2)
0.002	MF	C1, C7
33	MF	C2,C3
0.1	MF	C4, C6
0.068	MF	C5
0.47	MF	C8
330	pF	C9
68	pF	C10
100	MF	C11

cont'd on p. 71

Ultra Term: 160 Column Display

steve johnson

a mini-review
of an extraordinary
video display product



The Ultraterm
A.P.P.L.E. members *$310.00*
Videx *$379.00*
897 N.W. Grant Ave.
Corvallis, OR 97330

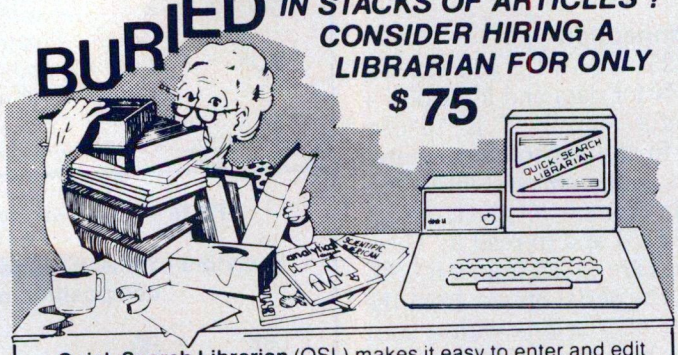
THE Videx Ultraterm 160 column board is a delightful and useful addition to the computer buff's repertoire of equipment. Even though you may already have an 80 column board or an Apple *IIe*, you will find many uses for this innovative board. Basically Videx Videoterm compatible, the Ultraterm has so many new features you'll have to spend some time reading the manual to find out about all of them.

Perhaps the nicest features are those involving video attributes. The display can be in highlight/lowlight and inverse/normal with a choice of two character sets. Proper use of these functions can greatly enhance programs such as THE Spreadsheet 2.0. In fact, UltraPlan from Videx does just that.

The other most innovative functions are those operating commands dealing with the number of characters on the screen. Nine distinct combinations of lines and columns are available. This is enough to keep you occupied for a long time. The various combinations are 40 x 24, 80 x 24, 96 x 24, 160 x 24, 80 x 24 with interlace, 80 x 32 with interlace, 80 x 48 with interlace, 132 x 24 with interlace and 128 x 32 with interlace. Won't these modes do wonders for business displays!

The interlace mode character sets are generally more appealing because the vertical dot spacing is half that of the 40 column Apple display. All this sounds really great, doesn't it! The board even supports the HOME command and all the Apple escape commands.

Should you decide that you would like to own one of these boards, I'd suggest that you get your dealer to demonstrate the board with the monitor you will be using. To display all modes well, the monitor must have a bandwidth of at least 18MHz and a persistence of the equivalence of P39. The Apple "Monitor III," recommended by Videx, has minor shortcomings such as a bandwidth of only 15MHz and a wide horizontal sweep (overscan). The former characteristic imparts slightly fuzzy but passable high density characters, and the latter causes characters to be invisibly printed behind the bezel in the 160 x 24 and 96 x 24 modes. The best choice may be the Amdek 300A which has a medium (P31) persistence, sufficient bandwidth and an amber display. Although this monitor is expensive, it will display all modes quite nicely.



Quick Search Librarian (QSL) makes it easy to enter and edit your journal references, search for articles, and print or sort a list of articles using the 48K APPLE* II + computer. Important QSL features include:

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- Four lines available for listing authors, title and/or comments.
- Powerful data base screen editing, copying and merging features.
- Average search speed is 50 articles/second with multiple criteria; average sorting speed is 40 articles/second when sorting on 3 fields.
- Typically, 1000 articles can be stored on a single disk.
- Includes sample data base and tutorial for *Scientific American*, 1981.

VISA or Mastercard orders accepted. QSL manual available separately for $5. (Price of manual deductible later with purchase of QSL software.) Add $1.50 for shipments made in U.S.A.

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Circle 24 on Reader Service Card

INTERACTIVE MICROWARE, INC.
P.O. Box 771, Dept. 48
State College, PA 16801, (814) 238-8294

Circle 27 on Reader Service Card

While you are out shopping, there is one other thing you should get if you don't already have one — a fan. The Ultraterm draws 800 milliamperes from the 5 volt supply. That is a lot if your computer is already nearly filled with cards. The fan will cool the components adequately while lengthening the lifetime of your Apple computer system.

The Ultraterm should be a useful addition to your system. As with the Apple *IIe* extended memory 80 column board, there are relatively few programs which utilize the extra 64k, but more are forthcoming. The board is engineered for quality, performance and reliability. The excellent manual includes clear instructions, explanations, program listings and schematics. A demonstration diskette is included.

```
10  REM
SO WHAT DID YOU EXPECT?

MICHAEL ZIOBER : CALL
    -A.P.P.L.E.

20  FOR A = 0 TO 7:
      READ A(A): NEXT
      :P = 0 * A(0)
      +  PEEK (131)
      +  PEEK (132)
      * 256: FOR A =
      1 TO 30: PRINT
       CHR$ ( PEEK (P
      + A - 1)):P =
      P + (A / 4 =
      INT (A / 4))
      NEXT
30  DATA 2.29956418E-14,1.04
      803651E-17,7.8948232E-
      30,2.1263968E-17,7.905
      80927E-30,7.11102523E-
      14,7.39925645E-13,4.24
      105196E-14
```

Communications Compatibility

novation, inc.

COMPATIBILITY, the bugaboo of the personal computer industry, is also infringing on the growth of the modem market. However, according to a major manufacturer of personal communication products, we should not try to set tomorrow's standards by conforming to yesterday's state of the art.

B.F. "Kess" Kessler, President of Novation, Inc., feels the answer to compatibility isn't in hardware, but software. He points out that technology is changing so rapidly that modem makers are having a difficult time designing one generation of products that is compatible with the next. For example, he cites the fact that a Hayes Micromodem can't talk with a Hayes Smartmodem.

"The fact that all modems should be compatible is obvious," Kessler states. "But with an industry still in its infancy, it would seem stifling to set hardware standards that could become obsolete overnight. Instead, the solution lies in software."

A good programmer, Kessler points out, is well eqipped to solve compatibility problems. The emphasis, he believes, should be on getting programmers to include software commands for expansion and compatibility with all popular protocols — CrossTalk, SmartCom, Lync, Mite, Microdom, IBM PC, CompuServ, and all the rest.

"Personal communications via microprocessors," Kessler notes, "is gaining momentum at an amazingly rapid rate. Next year more modems will be manufactured than have been built to date. Inevitably, new designs and technology will be introduced. And the marketplace will continue to respond positively to appropriate innovations. It will be far easier for software programmers to keep up with the state-of-the-art than it would be to shackle hardware manufacturers with compatibility standards that undoubtedly would hinder rather than help the growth of the modem marketplace."

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A Call A.P.P.L.E. Editorial

val j golding

WE hope you saw the February issues of some of the other major Apple magazines. If you did, you could not have missed the name Macintosh splashed all over them. We found out quite a bit about Mac by reading some of those articles. We suspect you did, as well.

Where was *Call–A.P.P.L.E.* during all of this?

If you expect to find the answer in these words, you may be surprised. We too are looking for the answer. Let's digress for a moment, because we'd like to explain the terminology "non–disclosure." Apple is traditionally tight–mouthed about its new hardware products, and justifiably so. Leaks to the wrong people could be disastrous to sales. Therefore with new products such as the *II*e, Lisa, and Macintosh, and others still to come, Apple requires legitimate publications, software developers, etc., to sign a non–disclosure agreement. The substance of this agreement offers legal protection to Apple in the event of leakage about the product. With this we cannot quarrel; it is essential to Apple's marketing strategy. We signed such an agreement prior to announcement of the *II*e, and we also had a beta test version of it, thus we were in a position to — at the appropriate time — provide our members and readers with the most current information on the *II*e.

So what happened with Lisa and Macintosh?

It is as if we did not exist. Rumors always abound, and we are often privy to inside information (which of course we honor and do not divulge), so going back almost two years, we requested through proper channels, an advance version of Macintosh, with the obvious understanding we would sign and adhere to any required non–disclosure agreement. More recently we begged (literally on bended knee) for information on Macintosh, both directly from Apple Computer and their public relations representatives, Regis–McKenna, Inc.

When we didn't receive advance information on the Lisa, Apple in effect told us: "Oops, we're sorry, we've had some changes here and you got overlooked. We'll take care of the problem." Additionally, it is worth noting that we frequently receive calls from Apple Computer when they have an event or product announcement they wish to publicize.

Legal agreements notwithstanding (ask Apple about the "Mystery House" debacle), and despite Apple's promises to include us in future releases, our pleas fell on deaf ears; we received absolutely nothing about Macintosh. We are not the new kid on the block; we've been around for some seven years, a pioneer Apple group, and one which, in our opinion, has played, and continues to play a tremendous role in influencing sales of Apple computers.

An honored guest at the January membership meeting was our good friend Randy Wigginton (a hacker from the early days) who was instrumental in the development of Applesoft][and DOS. (See the story elsewhere in this issue.) Randy wrote the word processor MacWrite which Apple currently supplies with the Macintosh, and appeared at our meeting because of his respect for A.P.P.L.E., not as a representative of Apple Computer, Inc. With the reams of non–Macintosh material in our February issue and without Randy, the meeting would have been bleak, indeed. Thanks, Randy.

cont'd on p. 71

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   No need to boot other disks at copy time

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Outside U.S./Canada add $10 shipping. Texas Residents please add 5% sales tax.
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Circle 22 on Reader Service Card

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ABC's of ABBS's

from p. 23

lists, and weird visitors – worse, you're telling potential burglars the address of a several thousand dollar computer system.)

In order to keep people interested in your system, you must update information and files. Some BBS's can keep running on their own, if there are enough users inputting information, but you must also supply interesting files, information, and things to do to keep people interested in your board.

Many BBS's go down within a few months of their inception. But if you follow the above procedure, and rules, then hopefully your system will be one of the handful which thrive and expand.

There are many well run systems around the country which I am on, and I'd like to thank the SYSOP's of those systems for their assistance in writing this article. Two friends and their systems were particularly helpful:

Mark & Lisa of Aphrodite East. This is an excellent couples board (other users also welcome) in Pompton Plains, NJ. The phone number is 201–831–1042, and it is up 24 hours a day. It is run on a TRS–80 Model III, but any computer or terminal with a Bell 103 compatible modem can call up.

Jonathan Gleich of Earth News Central. This is my own BBS. Topics include: Aerospace, Movies, Telecommunications, microcomputer software and hardware, and videotapes. There is also an online video section for VTR owners. The phone number is 212–934–0774, and it is also up 24 hours a day and Bell 103 compatible. It is run on an Apple][with three drives.

If you'd like to look around, type "DEMO" when asked for your password. If you want an account, state in the feedback section that you found out about Earth News from this article, then answer the new account questions.

Up to now I've talked mainly about some of the requirements for setting up and running a bulletin board system. Next month I'll discuss some of the standard protocols and commands used in BBS's, features you should consider in purchasing or writing a program, and other items of interest.

```
]LIST

10  REM

 SO WHAT DID YOU REALLY EXPECT?

VAL J GOLDING : CALL -A.P.P.L.E.

100  GOSUB 400:WINNER =  PEEK (98
     9) -  PEEK (992):TRICK =  PEEK
     (2050):GUESS = TRICK - WINNE
     R:LAM =  PEEK ( - 12031)
110 HAHA$ = FOO$ + ":D 44 49 53 4
     B 20 56 4F 4C 55 4D 45 20 32
      35 34 D D 2A 42 20 30 30 32
      20 53 4F D 20 52 20 30 30 3
     4 20 57 48 41 54 D 2A 41 20
     30 30 33 20 44 49 44 D 20 54
      20 30 30 33 20 59 4F 55 D 2
     A 53 N D9C6G": GOSUB 500
120 HAHA$ = APPLE$ + ":20 30 30 3
     7 20 45 58 50 45 43 54 3F D
     0 N D9C6G": GOSUB 500
130 TURN =  PEEK ( - 16151):TSKTS
     K =  PEEK ( - 7221): FOR SOW
     HT = WINNER TO GUESS:LFT$ =
     LFT$ +  CHR$ ( PEEK (( - 856
     )) - (WINNER + WINNER) * (LA
     M / (GUESS - 4))):RIGT$ = RI
     GT$ +  CHR$ ( PEEK (63809)):
     : NEXT SOWHT

140 D$ =  CHR$ (4):: POKE TSKTSK,
     PEEK (58530): POKE TSKTSK +
     WINNER, PEEK ( - 6435)::::::
     POKE TSKTSK + (WINNER + WIN
     NER), PEEK (61601) +  PEEK (
     - 3890): POKE TSKTSK + (GUE
     SS - (WINNER * 4)),( PEEK ( -
     1755))
150 HAHA$ = "6:A0 3 A9 0 4C C6 D9
     N 6G N D9C6G": GOSUB 500
160  CALL 64600: PRINT D$"CATALOG
     "LFT$RIGT$
170  CALL  - APPLE +  PEEK ( - GU
     ESS)
180  POKE 49384,GUESS: CALL 1002:
      END
400 FOO$ =  STR$ ( PEEK ( - 1302)
     *  PEEK ( - 115)):APPLE$ =
     STR$ ( VAL (FOO$) +  PEEK (
     63553)): RETURN
500  FOR SOWHT = WINNER TO  LEN (
     HAHA$): POKE ( PEEK ( - 1140
     2)) * WINNER * ( PEEK (1023)
      +  PEEK ( - 10941)) - WINNE
     R + SOWHT, ASC ( MID$ (HAHA$
     ,SOWHT)) + ( PEEK (54597) +
      PEEK ( - 10941)): NEXT SOWH
     T: POKE LAM,ERR: CALL 65392:
      RETURN
```

```
10  REM
SO WHAT DID YOU EXPECT?

MICHAEL ZIOBER : CALL
      -A.P.P.L.E.

20  FOR A = 0 TO 7:
      READ A(A): NEXT
      :P = 0 * A(0)
      +  PEEK (131)
      +  PEEK (132)
      * 256: FOR A =
      1 TO 30: PRINT
       CHR$ ( PEEK (P
      + A - 1));:P =
      P + (A / 4 =
      INT (A / 4)):
      NEXT
30  DATA 2.29956418E-14,1.04
      803651E-17,7.8948232E-
      30,2.1263968E-17,7.905
      80927E-30,7.11102523E-
      14,7.39925645E-13,4.24
      105196E-14
```

Protocol Primer

from p. 15

ceeds to another terminal on the line. In this protocol, the message processed is the characters between, but not including, the Start of Text, STX, character and the ETX character.

If the LRCs do not agree or a parity error occurs, the terminal responds with a NAK. At this point, the host may do one of two things. First, it could attempt to retransmit the message as shown in the diagram. In this case, the protocol proceeds as described in the previous paragraph.

Second, the host may send an EOT to the terminal. This essentially says to the terminal, "Forget it, I may try later." For example, if the terminal responds with a NAK after the 16th consecutive attempt, the host could be programmed to send the EOT. The host then proceeds to process another terminal on the line.

For a POLL, the sequence of possible events is summarized in Figure 6.

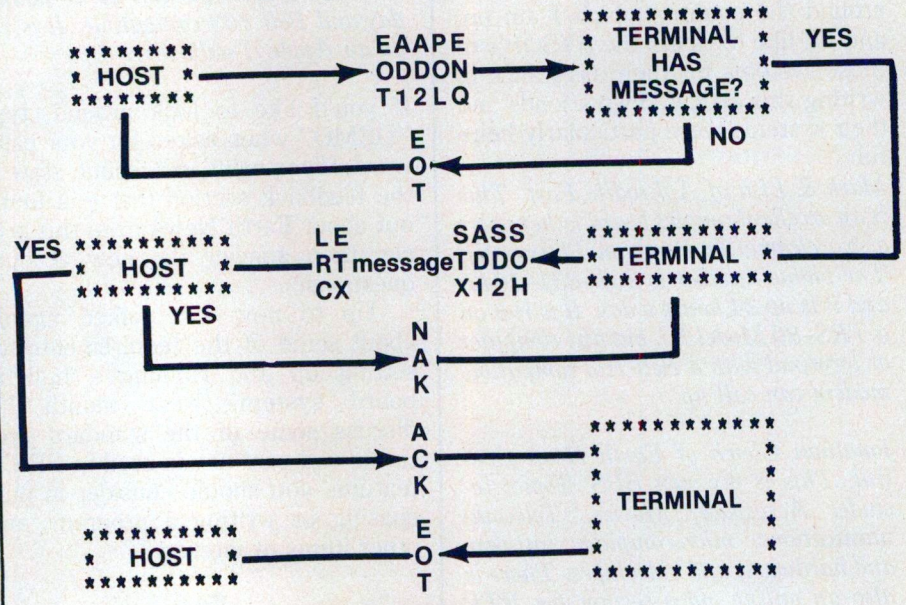

Figure 6. Burroughs POLL

Some details have been omitted from this figure for clarity purposes.

When the host wishes to POLL a terminal, it transmits the sequence EOT, AD1, AD2, POL, ENQ. This is called the POLL sequence. For the first three characters, EOT, AD1, AD2, each terminal proceeds as described in the SELECT discussion. Again, assuming AD1, AD2 is 1, 1 then Terminal 11 is the connected terminal.

When Terminal 11 sees the Poll character, POL, followed by the Enquiry character, ENQ, it knows the host is asking the question "Do you have something for me?" If the answer is no, the terminal responds with an EOT. The host then proceeds to other terminals on the line.

If the answer is yes, the terminal temporarily becomes a "host." In other words, it transmits to the host in the same manner as that described for SELECT mode. If the host detects no errors, it sends an ACK to the terminal, the terminal responds with an EOT, and returns to a listening mode looking for an EOT.

If the host does detect an error, it sends a NAK to the terminal which causes the terminal to retransmit its message. Although the diagram does not show it, the host may respond with an EOT instead of an ACK or NAK. This usually occurs when the host has tried say 16 consecutive times to receive a message correctly and failed each time. The EOT tells the terminal to retain its message and abort to looking for an EOT to signal the beginning of a POLL, SELECT, or other sequence.

This is by no means a complete discussion of the Burroughs protocol. In addition to NORMAL SELECT and POLL, the protocol also includes BROADCAST SELECT, GROUP SELECT, CONTENTION, and FAST SELECT. They represent variations of the two modes described here, variations which would add no more to the purpose of this article.

Some attention will now be directed to how the host generally services all of the terminals on a multidrop line such that each teminal has equitable service by the host. Several schemes are possible for any multidrop protocol, only one will be considered here.

In the host software that services the line, the host has what is called a POLL table which contains information such as the addresses (AD1, AD2 for Burroughs) of all terminals on the line. To start a sequence of events, the host could POLL each terminal on the line, call it a POLL pass. If any terminal has a message, the host receives that message, passes it on to other software, say applications programs, in the host and proceeds to the next terminal in the table.

Having polled all of the terminals, the host could then check a queue which contains a list of terminals to transmit messages to. If there is a message for a terminal, it is sent to that terminal then the host proceeds to the next terminal which has a

A Call A.P.P.L.E. Quickie

One bug has cropped up in the ProDOS Filer if you use the old monitor ROM. Any attempt to re-enter the Filer after exiting to BASIC.SYSTEM will cause an error message reading "* FFICIENT MEMORY TO RUN PROGRAM *". The following patch will correct the problem *(please do it on a copy)*:

```
BLOAD FILER, TSYS, A$2000
CALL -151
2160: EA EA EA
3D0G
UNLOCK FILER
BSAVE FILER, A$2000,
L25600, TSYS
LOCK FILER
```

...Cecil Fretwell

SELECT message. Call this a SELECT pass. Having performed a SELECT pass, the host performs a POLL pass, etc. Thus, each terminal has equal access to the host.

In this POLL, SELECT, POLL, etc. process, what if a terminal does not respond? For example, in the Burroughs protocol, the host sends out a POLL and waits for an EOT or message from the desired terminal. If that terminal is physically disconnected from the line, powered down, or malfunctioning, the host could wait forever for a response. What is usually done in this case is if the terminal does not respond say within 5 seconds, called a timeout, the host proceeds to the next terminal in the POLL table.

During this modern age, just one terminal not responding within 5 seconds is not acceptable if this timeout condition occurs during each POLL and SELECT pass. In other words, the response time of the entire computer network is impacted. Two of many possible solutions will now be discussed.

The first would be to have the host remove a non-responding terminal from its POLL and SELECT tables. Once the terminal is able to respond, a human operator would have to manually enter a command to the host computer to cause it to place the terminal back on line.

A second solution would be to have the host make a note of a non-responding terminal. Having done this, the host would poll this terminal say every fifth pass through the regular POLL and SELECT tables. As long as the terminal continues not to respond, this remains true. However, if the terminal does respond, the host removes its note regarding the terminal and now includes that terminal in every POLL and SELECT pass.

The last protocol to be discussed is the IBM Binary Synchronous Communications (BSC) protocol. The author has written code for a Digital Equipment Corporation PDP 11/34 minicomputer which uses this protocol along with an IBM sub-protocol called Intelligent Remote Station Support (IRSS) to connect to an IBM-IMS system. This article will not attempt to reproduce the IBM document given in the bibliography. It will concentrate on paralleling IBM's method of POLL and SELECT with the Burroughs protocol just described.

Two notes must be made about BSC before proceeding to the protocol itself. The more knowledgeable reader will note that the character streams discussed do not include the SYNC characters required for synchronous communications. For the novice reader, suffice it to say that SYNC characters are required by the hardware electronics to insure that proper characters are received and transmitted.

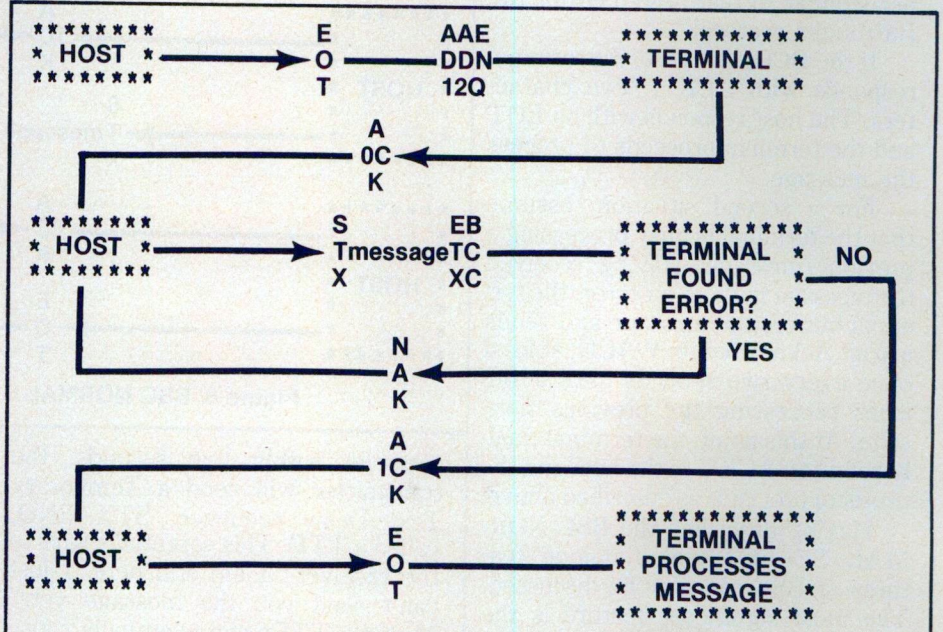

Figure 7. BSC NORMAL SELECT Single Message

The second note regards the character set used by IBM. Called EBCDIC (Extended Binary Coded Decimal Interchange Code), this is an eight bit code which uses all eight bits for a character. This provides 256 possible characters as compared to 128 possible characters for ASCII.

The fact that IBM uses all eight bits of a character does not allow the use of a parity bit on equipment which is standardly based on an eight bit entity. Although an LRC is still possible as defined earlier, without the parity checking capability, the ability to detect errors is greatly reduced.

To get around this reduced error checking capability and provide a more powerful method than that described earlier, IBM uses a two character (16 bits) Block Check Character, BCC, following the ETX in a message. This BCC is based on a cyclic redundancy check, called CRC-16, which is a division of the entire message, regarded as a huge binary number, by a constant. The quotient is discarded and the 16 bit remainder becomes the BCC. From a software point of view, a BCC computation is an order of magnitude more complicated than an LRC computation. Hardware is usually used to compute the BCC character.

For a NORMAL SELECT for BSC, a simplified sequence of events is summarized in Figure 7.

The initial comments made regarding NORMAL SELECT for the Burroughs protocol equally apply to the BSC protocol to include the significance of the EOT character. The sequence AD1, AD2 replaces the AD1, AD2, SEL sequence in the Burroughs protocol in the following manner.

For BSC, the AD1, AD2 sequence can be from one to seven characters and is called the Polling or Selection Address. In the first character of this address, if a specified bit is 1, the sequence specifies a SELECT, if the bit is a 0, the sequence specifies a POLL. The Polling and Selection Address causes the specified terminal to be "connected point to point" to the host with all other terminals "disconnected" from the line.

Figure 7 assumes a SELECT sequence. After the terminal

responds with ACK 0, two characters, the host sends its message to the terminal.

Figure 7 also assumes that the terminal is ready to process the message, therefore, the discussion will first proceed under that assumption. When the terminal sees the STX, it clears its BCC then receives characters and computes a BCC until it sees an ETX which is included in the BCC calculation. If the BCC it calculates does not agree with the BCC from the host, the terminal responds with a NAK and the host proceeds in a manner similiar to that described for the Burroughs protocol.

If the BCCs do agree, the terminal responds with ACK 1, two characters. The host responds with an EOT and the terminal proceeds to process the message.

For a second situation, assume that the terminal is busy processing a previous message. Having received the message without an error, the terminal buffers the message and sends a Wait Acknowledge, WACK, at least once every two seconds until it finishes processing the previous message. At this point, the terminal finally sends an ACK 1 to the host and the protocol proceeds as described above.

Having described the BSC NORMAL SELECT, some unique features of BSC can now be discussed. The most significant feature is the two second rule. Briefly stated, when a transmitter sends a sequence, it expects a response from the receiver within two seconds. If that response is not received within two seconds, some alternate action must be taken.

For the NORMAL SELECT just described, if the host does not receive an ACK 0 within two seconds, it will repeat the EOT, AD1, AD2, etc. sequence. After say 16 consecutive timeouts, this condition could be handled as described for the Burroughs protocol.

This now produces a greater understanding of the necessity for the terminal to send a WACK to the host if it is busy. This is essentially saying "I'm still alive but busy so don't time me out." If the terminal fails to send NAK, ACK 1, or WACK within two seconds, the host will send ENQ to the terminal which basically says "Are you still there?" After say 16 consecutive timeouts, this condition could be handled as described for the Burroughs protocol.

Since both the transmitter and the receiver must adhere to the two second rule, if a receiver expects a message and for some reason the transmitter can not transmit that message within two seconds, the transmitter will send a Temporary Text Delay sequence, STX ENQ, called a TTD. This essentially says to the receiver "I am still here, I just can't send you the message yet." Multiple TTDs can eventually cause the host to send an EOT saying to the terminal, "Forget it" and look for a POLL or SELECT sequence.

The final unique feature is the ability of BSC to process more than one message in a NORMAL SELECT. Figure 8 summarizes how this is done.

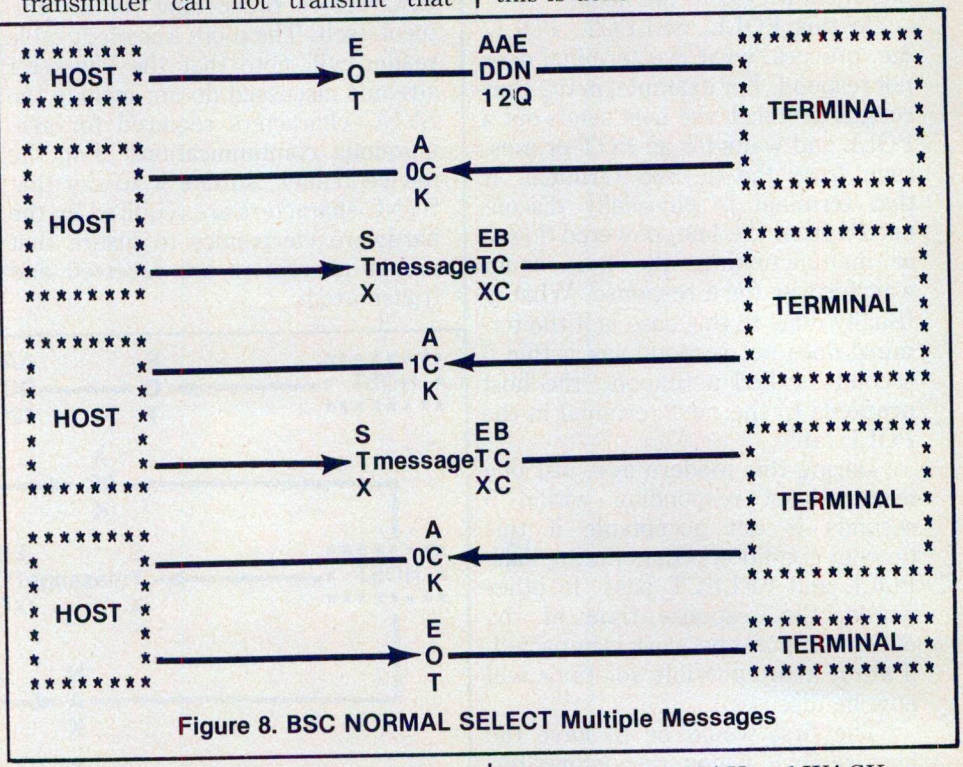

Figure 8. BSC NORMAL SELECT Multiple Messages

For clarity, the NAK and WACK conditions have been omitted from the diagram, i.e., the diagram assumes ideal conditions.

At the end of the first message, the terminating character is an End of Transmission Block, ETB, not an ETX. This signals the terminal that it can expect at least one and maybe more messages without an interven-

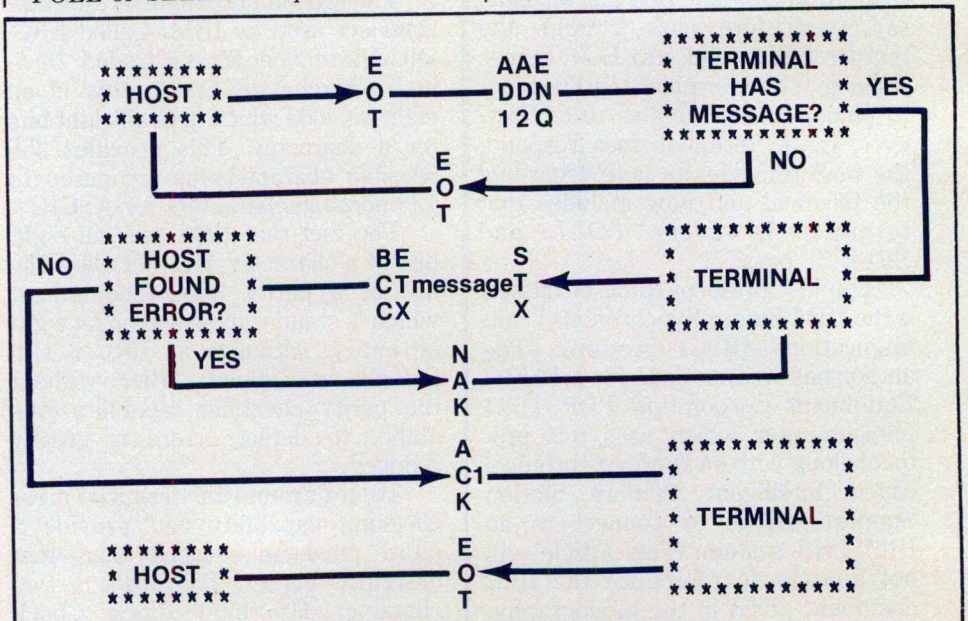

Figure 9. BSC POLL Single Message

ing EOT, AD1, etc. sequence. Use of an ETB instead of an ETX provides the ability to process multiple messages in SELECT mode. When the terminal sees an ETX at the end of a message, it expects an EOT from the host instead of another message.

The reader will note that the terminal acknowledges the messages alternately with ACK 0, ACK 1, ACK 0, etc. If, for example, the host receives ACK 0 when it expects ACK 1, a recovery procedure must be invoked to either abort the SELECT or make provisions to insure the receipt of the proper ACK 1. The procedures to follow are beyond the scope of this article.

For a BSC POLL, the sequence of events is summarized in Figure 9. This sequence is triggerd by the fact that the specified bit in AD1 is 0.

In POLL mode, if the terminal has no message for the host, it responds with an EOT then the host proceeds to process other terminals on the line. If the terminal has a message, it temporarily becomes a "host," i.e., it transmits its message to the host.

If the host detects no errors, it sends an ACK 1 to the terminal and the terminal responds with an EOT. The terminal is "disconnected" from the line and the host proceeds to the next terminal on the line. If the host does detect an error, BSC proceeds in much the same manner as described for the Burroughs protocol.

As in SELECT mode, during a POLL mode the terminal can send multiple messages to the host without an intervening EOT, AD1, etc. sequence. Assuming ideal conditions, Figure 10 shows how this is done.

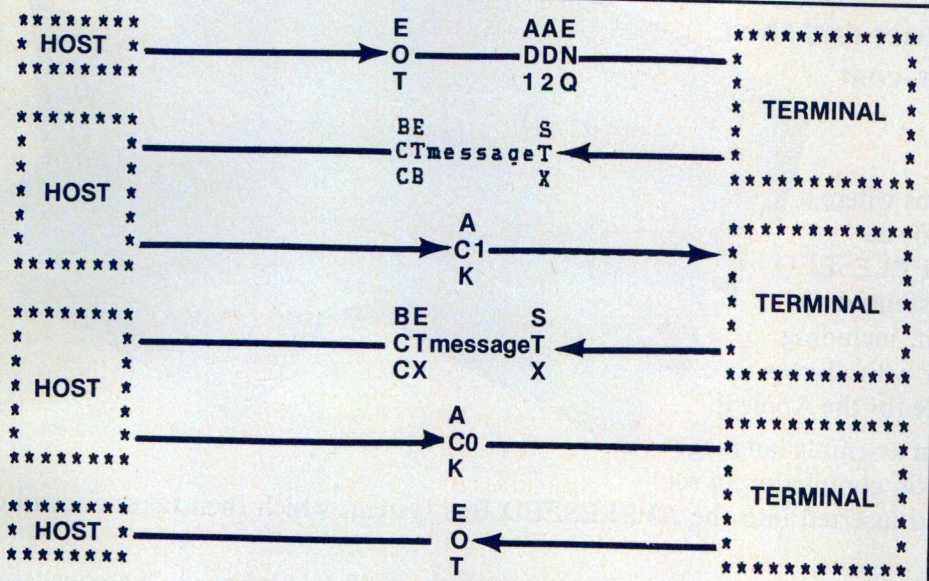

Figure 10. BSC POLL Multiple Messages

The discussion for the corresponding SELECT diagram applies to this diagram.

As a final topic for BSC, recall that an earlier paragraph stated that an ETX included in the body of a message will cause the message to be prematurely terminated. It will now be shown how it is possible to include the ETX and other control characters in a message. What is to follow could also be incorporated into the Burroughs protocol.

For obvious reasons, characters such as STX, ETX, EOT, ETB, ACK, NAK, etc. are called control characters. Making provisions for them to be included in the body of a message is called transparent mode. Figure 11 shows an example of how this is done.

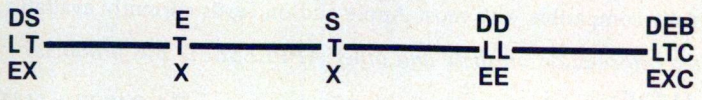

Figure 11. Transparent Mode Message

The key control character which provides transparent mode is called the Data Link Escape, DLE, character. When the receiver sees a DLE, provided by the transmitter, it knows that the character to follow is a control character.

In the example, DLE STX indicates the start of a message. In this sample message, the ETX and STX in the body of the message are not regarded as control characters because they are not preceded by the DLE character. Note that the end of the message is signaled by DLE ETX.

The sample message also shows the DLE DLE combination. If a message is to contain a DLE character then DLE DLE is included by the transmitter. On the receiver end, this DLE DLE is translated into a single DLE and is included in the body of the message. In other words, if the character following a DLE is a DLE, the receiver knows to store a DLE instead of looking for a control character to follow the first DLE.

Very little additional software is required to include both non-transparent and transparent mode capability. For a message, one simply looks at the first character. If it is DLE, then the remainder of the message is assumed to be in transparent mode. If it is not a DLE, then non-transparent mode is indicated.

This concludes the discussion of the IBM protocol and the article. Again, this article has not attempted to describe all of the minute details of each protocol. The bibliography shows references to the two protocols discussed here. Ten years of experience by the author in this field have shown that protocols are not only highly manufacturer dependent, but also, very application dependent. Preparing and testing the software for a protocol is not a trivial task. Handling ideal conditions requires very little software, the major headaches arise when recovering from the various error conditions.

Bibliography

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General Information – Binary Synchronous Communications, IBM Systems Reference Library, Order No. GA27-3004, October, 1970.

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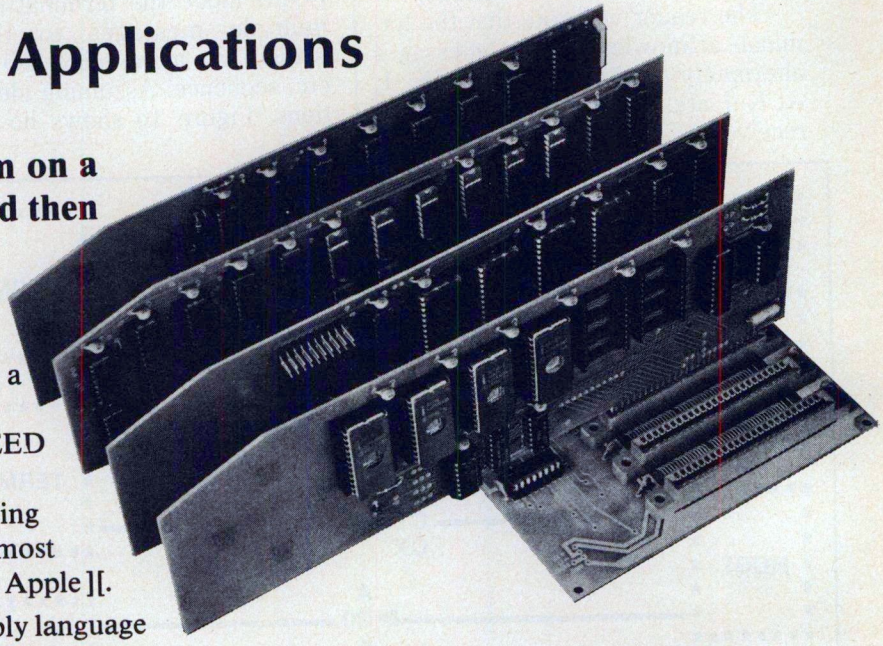

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CPU BOARD The 6502 has been removed from the mother board and included in this card, which also contains the clock circuitry for the system.

64K RAM BOARD 64K of dynamic RAM with provision for control to be used in the normal Apple][conventions; deleting COOO-CFFF and software control over the DOOO-FFFF area.

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Circle 17 on Reader Service Card

A.P.P.L.E. Doctor

bruce f field

WILTON Helm from Thousand Oaks, CA has raised a point about using a firmware card in slot 4. Some programs (in his case Lisa 2.3) look for a clock card in slot 4 by reading the signature bytes at $C4XX. In Wilton's Apple this turned on a Mountain Hardware EPROM burner which then conflicted with other peripheral cards. However, Wilton suggests that a similar situation could occur with a firmware card if a program assumed some other card was in that slot and accessed its Device Select addresses. This would probably cause the program to do unpredictable things. Actually I think this is not a likely occurrence, as it is dangerous to access Device Select addresses of unknown cards. I don't know of any programs that do this. Firmware cards ignore I/O addresses (such as $C4XX for slot 4). However, you might want to remove your firmware card if it is in any slot other than 0 if you are having problems with a program.

I have also received a couple of comments on using interrupts with DOS, a question that was answered in a previous column. The problem is that both DOS and the Monitor use location $45. Wilton Helm writes that rather than change the Monitor program (which must first be copied from ROM to a language card), it is better to change DOS.

> "Location $45 is used at the following places in DOS 3.3:
> $A133 $A13E $A158 $A1BE $A1D3 $A1E8 $A1F7 $A1F9 $A201 $A2CC $A767 $A77F $ADBA $AE0A $AE54 $AE58 $BED3 $BF16 $BF39 $BF55 $BF57 $BF5B $BF9D $BFA3 $BFA5.
> These locations should be changed to $46. Location $46 is used for only one purpose, at $BA06 and at $BDA4. These two locations should be changed to $2C. Location $2C is used only by RWTS subroutines and does not conflict with this additional use. The end result is that DOS no longer uses $45 nor any new locations."

These modifications have been made in Universal DOS (a fast DOS) and similar patches have been made in Diversi-DOS (another fast DOS). Stephen Silverman from So. Burlington, VT also points out that Southwestern Data Systems markets a package called Doubletime Printer that contains a modified F8 Monitor ROM, however at $120 this is a rather expensive solution if all you want is interrupt capability.

ProDOS, the new DOS from Apple (available now) will also work properly with interrupts. In case you missed it, Gary Charpentier and David Sparks had an article describing ProDOS in the November 1983 issue of *Call -A.P.P.L.E.*

Question

I have been trying to read the volume number from D1 and D2 in S6 from within a program. The best I have been able to come up with is the volume number of the booted disk. Your assistance would be greatly appreciated.

Answer

The volume number of the disk last accessed can be found by a PEEK(47094) for a 48K Apple with DOS 3.3. For example, suppose you have just booted up on drive 1, PRINT PEEK(47094) will print the volume number of the disk in drive 1. To find the volume number of drive 2, execute a DOS command to access drive 2 such as PRINT CHR$(4)"CATALOG, D2".PRINT PEEK(47094) will then print the volume number of the disk in drive 2.

This method returns the volume number that is encoded in the address fields of the diskette, not the volume number in the Volume Table Of Contents.

Question

I need your help. I have an Okidata Microline 80 Printer and I also have the Dow Jones Market Analyzer. A user jump routine is needed in order to print out the graphs. The only help given in the manual is for the Silentype, Trendcom, and a printer using the Grappler interface card. I do not have a card but the first two routines do not work.

Answer

I have received several questions similar to this one, I will try and discuss generally how to print the High-Res screen on a printer.

The first requirement for printing the High-Res screen is to have a printer with graphics capability. This means that the printer must be controllable by some means to allow printing of individual dots in any desired pattern. The most common type of printer used for this is a dot matrix printer. But, a daisy wheel printer can be used if the carriage can be moved in small increments so that periods can be printed next to each other with little or no space in between them. Printing a Hi-Res screen one dot at a time with a daisy wheel printer is very time consuming and I don't recommend it, however it is possible to do so with some daisy wheel printers.

Secondly, you need a program to "read" the dots from the High-Res screen and send them to the printer in the proper format. Each printer requires the data to be formatted in a different way so that it is not always possible to use just any printer with any program. This programs are commonly called "screen dump" or "High-Res dump" programs because they take information from the screen and dump it to the printer.

Also you should know what type of printer interface card you have in your Apple. This is very important as many of the cards already contain a screen dump program on the card. The Grappler, Pkaso, and Silentype cards all contain dump programs to allow you to print the

High-Res screens using a simple command. (The Silentype card is a special interface card and will only work with the Silentype printer.) Check your printer interface card manual to see if your card does have this feature and how to use it.

To use the Grappler card for example, you must first turn it on (activate the printer) and then send the command [Ctrl-IG]. You can do this from Applesoft with the following commands.

```
100 PRINT CHR$(4)"PR#1": REM
    TURN ON PRINTER IN SLOT
    1
110 PRINT CHR$(9)"G": REM
    SEND CTRL-I G
```

The 9 in CHR$(9) is the decimal equivalent of the [Ctrl-I] character. If your graphics generating program is written in Applesoft and can be modified all you need to do is insert the above commands in the program where it asks you if you want to print the graphics.

If you don't have a card with such a program all is not lost, there are programs available (Printographer and Zoom Grafix are two among many) that you can load into your Apple to dump the High-Res screen to the printer. These programs usually have more capability in scaling and cropping the picture than the programs built into the interface cards. In this case you will probably have to stop the graphics generating program to load and run the screen dump program. It is perfectly acceptable to stop the graphics generating program using [Ctrl-C] or RESET; the graphics picture on the screen is not modified in either case. Once you stop the program and get the Applesoft prompt you can load and run the screen dump program. If necessary, you can boot up on a "slave" diskette and the graphics picture will not be disturbed. How do you know if you have a "slave" diskette or not? Any diskette that you have initialized using the DOS INIT command is a slave diskette. To make it a master diskette, you must run the program MASTER CREATE on the System Master Diskette. Now that everybody has at least 48K of memory there is no advantage to converting slave diskettes to masters.

Remember, the printer interface card is an important part of the printing process. When you are looking for a program that prints to a printer, especially High-Res screen printing programs, make sure the program is compatible with your printer and interface card.

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Circle 24 on Reader Service Card

Question

I recently acquired Call -A.P.P.L.E. in Depth *number 3, "All About DOS" and am attempting to use a Microsoft 16K RAM card in slot 0 and an Applesoft firmware card in slot 4 with my Integer Apple II. I have several questions.*

Somehow the machine recognizes the firmware card in slot 4 on power up. With the firmware card's switch up, [Ctrl-B] yields Applesoft; with the card's switch down, [Ctrl-B] yields Integer. Why and how is slot 4 "looked at" without even booting a disk?

Answer

The switch on the firmware card only controls what happens when the Apple is RESET or turned on. With the switch up and RESET pressed, the language on the firmware card (Applesoft in this case) is activated. With the switch down and RESET pressed, the motherboard language is activated. [Ctrl-B] just starts the activated language. In addition to the switch, the card can be turned on or off by accessing some soft switches. If the card is in slot 0, $C080 turns the card on while $C081 turns the card off. For slot 4 the addresses are $C0C0 and $C0C1 respectively.

Question

I also have GPLE and the documentation refers to DOS MOVER and says to BRUN DOS MOVER and then BRUN PLE.DM. There is no DOS MOVER program on my GPLE disk. Is this reference intended to be to PLE DOS MOVER? What does PLE.DM do and why is it necessary?

Answer

Yes, as you surmised, the DOS mover program to be used is PLE DOS MOVER. When you BRUN this program it will move DOS and then re-run the Hello program. The Hello program on the version of GPLE I have seen, automatically BRUNs PLE.DM after DOS is moved, so it is not necessary to BRUN it again. If you don't get the GPLE title line and copyright notice printed on the screen after moving DOS you will need to BRUN PLE.DM. The PLE DOS MOVER program is similar, but not identical to the DOS MOVER program described in All About DOS.

Question

I am also attempting to implement "The Firmware DOS Switch" and its related programs in All About DOS. When I run HELLO and choose a normal boot, while the message "Enabling The Firmware Card in Slot 4" is displayed the program stops, displaying "000C- A=00 X=00 . . ." Is this the way the Firmware Switch is supposed to end?

Answer

This problem is most likely that you have saved the HELLO program as an Applesoft program while you have Integer Basic on your motherboard. The article explains that if you have Integer Basic on your motherboard, the HELLO program must be saved as an Integer program.

The "000C-" etc. displayed on your screen simply tells you that you have executed a special machine language instruction called BRK or break. In this case it means that somewhere a machine language program went haywire and got into an area of memory that was not part of the program. The numbers displayed are usually not helpful in determining what went wrong, they are the address of the break instruction plus 2 and the values of the 6502 registers. You are now in the Monitor program in your Apple. To get back to BASIC type [Ctrl-B].

Not to confuse you, but if you want to become compatible with 99% of the Apple world, you can exchange the Applesoft ROM chips on your firmware card with the Integer chips on your motherboard and you will have an Apple II+.

Question

This is a question about preventive medicine rather than a problem. I'm planning to use my Apple in outlying areas with undependable electrical service, and occasionally on a generator in a motor home. Any precautions I should take to prevent damage to my equipment?

Answer

As regards electrical damage to the Apple, the Apple is rather robust. Other than running it at too high or low a voltage, greater than 132 or less than 107 VAC, or having voltage spikes on the line, there should be no problem. At the very least you should consider some kind of a spike suppressor as this is a good idea no matter what powers your Apple. Unfortunately this is not the whole story. If power were to fail while you were writing to a diskette, even for less than a second, information on the diskette would be destroyed. A spike suppressor will not help with power failures, for this you will need an Uninterruptable Power Supply (UPS). A UPS consists of a power supply that converts 110 VAC to DC to charge a battery and run an inverter that converts the DC back to 110 VAC. If the power fails the battery automatically supplies power with no detectable change in the output. The bigger the battery the more running time you will have, but usually all you need is enough time to finish what you are doing and save your work to disk. The bad news is that UPSs are somewhat expensive, starting at about $300.

Question

The Apple][has a mini-assembler in Integer Basic in ROM. I am told that there is a mini-assembler in software for the IIe. True?

Answer

Yes, in fact the mini-assembler can be used with a //e or a][+ if it has a language (RAM) card in slot 0. To use the mini-assembler boot up on your System Master diskette (DOS 3.3) and it will load Integer Basic and the mini-assembler into the RAM card. To activate the mini-assembler type INT to turn on the RAM card and get into Integer Basic, then type CALL -2458 ($F666G) to run the mini-assembler.

The mini-assembler is a elementary assembler that takes assembly language instructions as they are typed into the Apple and converts them into machine code. The mini-assembler is good for beginners who don't want to invest in a more expensive assembler (anything is more expensive than free) or for making quick changes to existing code. Other than EXECing in a text file there is no convenient way to save the assembly language source on disk, nor are any labels allowed. The mini-assembler is described starting on page 49 of the Apple][Reference Manual and page 110 of the Apple *IIe* Reference Manual.

Question

While writing a certain machine code routine, I came across the need to know exactly where the last character was placed in the keyboard buffer ($200 - 2FF). This is one of the more mysterious aspects of the Apple which has not been frequently documented — how does the Apple put a character typed from the keyboard into the keyboard buffer?

Answer

Most keyboard input to the Apple is handled by a machine language routine at $FD6A in the F8 Monitor ROM. The Applesoft command INPUT calls this routine or you may call it directly from machine language. This routine prints a prompt character on the screen (the character value stored in location $33), then waits for a key to be pressed, prints it to the screen, and also stores it in the keyboard buffer $200 to $2FF. The routine loops around for more key presses and returns to Applesoft or your machine language program when you press the RETURN key. The ASCII values of the keys pressed are stored in the order in which you pressed them starting at $200 for the first key. The eighth bit is set, therefore the value stored for "A" for example is not 41 but $C1. The X register of the 6502 microprocessor contains the position in the buffer of the value of the last key pressed (which must be a carriage return, $8D) or equivalently the X register contains the number of characters typed, not counting the return character. Unfortunately the X register is not accessable from Applesoft, but can be used in your machine language routine. This routine also provides all the standard Apple editing features, ESC I,J,K,M.

Question

How do you get audio from an Apple //+ to an Amdek monitor?

Answer

Very carefully. Seriously, you *cannot* take the two wires that go to the speaker and connect them to the audio input of the monitor. At best this would short out the Apple power supply, at worst it would destroy it. You need a small circuit that couples the speaker signal to the monitor using capacitors or a transformer. A small transformer from Radio Shack (#273-1380) can be used with a potentiometer on the output (primary) side to reduce the signal so as not to overload the monitor input. Happ Electronics Inc., 4640 Island View, Oshkosh, WI 54901, (414) 231-5128 makes a Hi-Fi Adaptor ($25) to allow you to connect the Apple speaker output to a stereo or high-fi. This would also work with your monitor. Such an adapter is also needed for a *IIe*.

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Circle 25 on Reader Service Card

—A.P.P.L.E. BITS & PIECES

MARCH 1984

MEMBER BILLBOARD

Of Crates and Stuff

TELECOMMUNICATIONS is a subject we hope we covered quite thoroughly in this issue. What does telecommunications really mean? Our handy dictionary tells us it is "The science of communications via telephone, telegraph, radio, etc." That's what we'd like to open with.

A.P.P.L.E. does a lot of telecommunicating, not all of it with computers. But let's first look at the A.P.P.L.E. Crate bulletin board. You might like to read, or re-read Phil Chien's story this issue to find out exactly what a bulletin board is, but in brief, the name tells the whole story, it is basically a medium for users to contact one another and exchange information through a message retrieval and reply system.

We recently relocated the "Crate" to our general offices in Kent, where (barring occasional failures) it cranks merrily away 24 hours a day. The new telephone number (in case you missed it when we moved), is (206) 872-6789. All you need to access it is a modem (such as our Modem II) and a steady finger on the dial. New users upon request will be assigned a userid number, which is validated after we verify your telephone number. Validation is required before you can enter messages; this prevents the system from becoming filled with fake id's which would never be used, and also offers a measure of security and privacy.

The Crate's popular "Open Forum" message section is an interesting feature which provides both user anonymity and lively discussions on varied topics. The Crate is mainly a rework of an antique BBS, and is mostly held together with scotch tape and chewing gum, so treat it kindly and enjoy.

Telephones are Tricky

Telephones are the mainstay of any business, and that includes us. Our main office number is (206) 872-2245, and our business hours are from 9am to 4pm, Pacific time, Monday through Friday. When we "pull the plug" at 4:00, our main line is transferred to the answering service, who quite naturally answer "A.P.P.L.E."

This is often confusing to members who may be unaware of the correct time zone difference, and end up making an unnecessary toll call to check on an order. To avoid disappointment, you should check the time before placing a call. If you live in New York City or Boston, for example, the latest you can reach us is just before 1pm, your time. On the other hand, you can call us after 6am your time, and take advantage of the lower tolls in effect at that time.

If you do reach our answering service, remember, they are just that. They do not have familiarity with our products, nor access to our computer records. They'll be happy to take a message and relay it to us the next business day. If it requires a response, such as an order inquiry, we'll check it as expeditiously as possible and, as needed, dash you off a note in the mail. It's best to check during business hours; we can often give you a reply on the spot. Our *24-hour* toll-free order line (800) 426-3667 is staffed by the same service, and the same conditions apply: they can take your order only, and cannot handle product or other information.

Our technical Hotline offers 70 hours of technical assistance and product support each week. Daily hours are from 9am to 3pm and in the evening from 6pm to 10pm. Weekday chores are shared by Butch Greathouse and Mike Crosiar, both talented programmers, while evenings and weekends are handled by Val Golding, our sometimes whimsical editor. Because the evening/weekend Hotline is not handled out of the main office, questions requiring access to the computer, or assistance from some of the other technical staff are best handled during the weekdays. We hope that by keeping some of these guidelines in mind, we can provide better service for you.

Feedback

Feedback is also telecommunications terminology. It means the return of a portion of an output to an input of the same system. In more general usage it means an informative response or reaction. That is part and parcel of this column. It is a billboard; you should feel free to post your comments here.

We received one response to our February issue so fast we had no inkling copies had reached the members yet! Isaac Molho wrote with some sharply critical comments on our new cover and interior design, comments which should be addressed. Isaac related the recent increase in dues to our new cover and interior design, and questioned our need for a mainframe computer (actually a mini). Some of his points indicate a shortcoming on our part, a failure to communicate effectively to our members. That in itself justifies the presence of this column, a feature he described as "justification."

We need, therefore, to talk about *Call -A.P.P.L.E.* and A.P.P.L.E. A.P.P.L.E., while in the eyes of the IRS is a profit-making organization, is incorporated under the laws of the state of Washington as a non-profit corporation, and functions as such. Our Board of Directors serve without remuneration, and many of our paid staff contribute far more of their time than they are compensated for. We have expanded by leaps and bounds, often barely keeping up with our growth. We have found out, often the hard way, how very essential it is to conduct our business in a competent and professional manner, while at the same time continuing to offer our members low prices and improved services.

Call -A.P.P.L.E. costs somewhere in the area of a half million dollars per year to produce and edit. Dues fall far short of meeting those costs, even at the new rate. Traditionally, advertising revenue meets or exceeds magazine production costs, at least as far as commercial publications are concerned. *Call -A.P.P.L.E.* is different. From the start, we have striven to offer you the finest quality, the best information available, the highest caliber of technical writing, supported by dollars from other areas.

We have reached a crossroad.

The interests of our members and those of the Apple community at large have changed, expanded. We need to expand with them, to cover more areas and more levels of Apple computing. New species of Apples have come upon the scene, the Lisa, the Macintosh. They too deserve space. School systems and educators are buying Apples by the bushel. As members, we must serve their needs as well. Neither must we neglect our hard core of programmers and hackers, they are still there in approximately the same numbers as ever, thus we must look to new ways to be all things to all people.

We have made recent economies which will save us several thousand dollars each month on *Call –A.P.P.L.E.* We have searched the country for a quality printer to handle our press run at a reasonable rate. We have just brought our art department in house. This gives us far more control over the appearance of the magazine and, for the first time, an opportunity for editorial to work in close coordination with art. We are (by comparison) a small, specialized publication, yet to survive, we must compete in a field of 30 or more magazines where, just a year or two ago there were a mere dozen or so. Advertising dollars are spreading ever thinner as the field grows. Many of the newer magazines have already failed and/or gone bankrupt. We will not. We've been around these seven odd years, and we will be around for many more. To do this, we need to attract more advertising dollars, we need to at least triple newstand sales.

Our new covers, so beautifully executed by Ron Keister will contribute to a new and more saleable image. So will Ed Adams' outstanding work on interior design. As members of the world's largest Apple Computer user group, you have a vested interest in our success. We are all working hard to achieve our goals and you too can help. Take this copy of *Call –A.P.P.L.E.* right now to any Apple dealer or bookstore that does not carry it and show it to the owner or manager. Explain to him how *Call –A.P.P.L.E.* can help increase his sales. Show him how our reviews of current products can make money for him. Tell him about our Hotline, how we provide technical support for his customers, his products.

A good salesman is one who believes in his product. As a member, you obviously believe in *your* club, or you would not be reading this now. Contact your area dealers and ask them to a take a minimum of 10 *Call –A.P.P.L.E.s* each month. Get it in writing and mail it to us, along with your name and address and member number, and we'll send you a coupon for one free A.P.P.L.E. label software of your choice. It's that easy. Let's go gang, let's make *Call –A.P.P.L.E.* the magazine you want it to be.

Next time around (and boy, oh boy were we ever windy here), we'll try and tell you a little about our order processing system and our System–38 computer, that li'l ol' lifesaver.

Editorial from p. 58

Is our image like that of a tarnished coin, with the motto "hackers" rising over the sublimated engraving "We support all Apple applications" on the surface? Is this Apple's perception of us, and the hundreds of other user groups around the country? We believe so. We believe Apple looks at us, and the other groups, as a bunch of "hackers." And Apple couldn't care less about the hackers; hackers do not fit their current marketing targets. Nothing could be further from the truth. Contrary to Apple's near–sighted view, user groups, our own included, are not living in the dark ages. We believe the majority of the user groups have grown with the times. We believe we cater, in addition to the hackers, to the needs of the current user, the businessperson, the educator, the end user.

Why did you buy an Apple? Were you impressed by a dealer's pitch? Did a friend recommend it? Did you pick up a copy of *Call –A.P.P.L.E.* at a computer store and call the Hotline for information? You may very well have. And because we are obviously biased toward a great computer, you certainly must have received an enthusiastic response along with considerable encouragement to invest in an Apple.

At the same time, you probably received information on A.P.P.L.E. and how we support Apple products and how we could help you if you made the proper purchase decision. This has been our mission from the beginning: to aid the Apple user with his/her current needs.

We want to know: Have we been following the right path? Are we in tune with the times? Are we barking up the wrong tree? What should be our future course? Should we grind out from the rumor mill such clues as we can find to share with our readers and members, perhaps risking Apple's ire? Let us know. You, the reader, you the member can provide us with the input. Drop us a line; communicate your thoughts.

Where have we gone wrong? Or have we. Or is it Apple that has gone wrong. That is the real question.

Infra Red Controls

from p. 55

Other Components

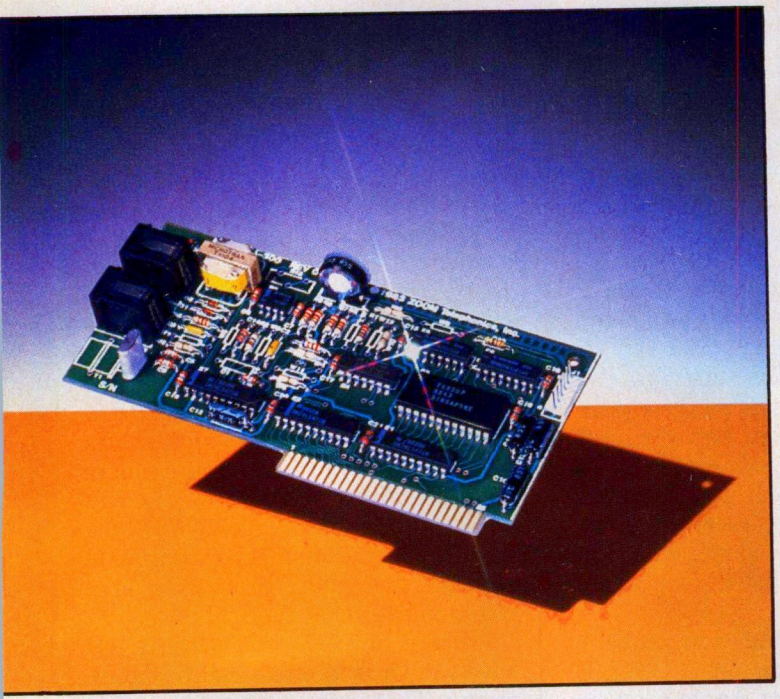
D1, D2	TIL 413 photodiodes by TI
D3	5 volt zener diode like 1N4733
L	100 mH inductor, LJ 410 from Mouser Electronics
SN76832-AN	receiver chip by TI
8251A	USART by Intel
CD4001	CMOS quad 2–input gate
CD4024	CMOS counter
74LS02	TTL quad 2–input gate
4–wire cable	Radio Shack 278–365
Hobby Prototype Board	A.P.P.L.E. product #HP11 or Vector 4609
Sockets	dip 14, 14, 14, 28

The parts can be purchased from a variety of vendors. In a few cases I have given Radio Shack and Mouser Electronics numbers because these parts are hard to find. The TI receiver and transmitter chips and LEDs must be purchased from a franchised distributor although Radio Shack carries TI photodiodes. The TI Application Note *Infrared remote control with TI products* by R.E. Smith SGDA001 became available in the summer of 1983. Copies can be obtained by calling TI Optoelectronics Dept. (214) 995–3821. If there is sufficient interest, I can supply bare P.C. boards for the hand held responder.

Tomorrow's Apples Today

kevin donohoe

NOTE: These products are presumed to be state-of-the-art. Call -A.P.P.L.E. does not necessarily endorse products published in this column as we have not tested them.



LOW-COST MODEM WITH COMMUNICATIONS SOFTWARE

Zoom Telephonics, Inc., has introduced a modem and communications software package for Apple][family computers to retail at $129. The package consists of Zoom's "Networker" modem and software, providing everything required for on-line communication. The company has also introduced "Netmaster" software, a sophisticated communications software package for the Apple, at $79. The products are sold separately and in a combination package for $179.

Apple Computer users can obtain a free subscription to The Source, a leading database resource, if they purchase the Networker modem for $129 after Jan. 1, 1984. The Networker is a single slot, 300-baud modem designed for Apple][,][+, and *IIe* computers. It combines complete modem functions and Apple communications circuitry on one card while providing direct, low-noise, modular telephone connections. A diskette with required communications software is also included.

The Networker combines the functions of a conventional modem, the Apple communications card, and communications software costing as much as $325. At no additional cost, the new unit is also furnished with software that permits the screen image to be captured in the Apple's memory (RAM).

Zoom's Netmaster is a "communications freeway" which enables high speed transmission and error-free copying of any program or data file through noisy telephone lines.

Networker

Networker is a single slot, 300-baud direct-connect modem designed for Apple][,][+, and *IIe* computers. It is completely self-contained, combining modem and Apple communications circuitry on one single-slot card, and provides telephone connection to computer data bases without the need for additional peripherals or software. The unit plugs into any Apple I/O expansion slot, and uses the computer's power.

Networker is compatible with any communications software that uses a standard communications interface, and is FCC approved for direct connection to any modular phone jack. It can operate at speeds up to 300-baud; a simple software command makes the change. The off-board originate/answer switch has a "carrier detect" LED that lights up to inform the user when contact with the other party has been made. In addition, complete status information is displayed on the Apple's screen.

Netmaster Software

In addition to transmitting files with full error detection and correction, Netmaster supports auto dial and answer (Micromodem), remembers frequently used phone numbers which are stored on a disk and can be modified at any time; records conversations into a very large text buffer of more than 40K on a 64K system, offers keyboard macros for flexibility and speed, supports upper and lower case as well as shift key modification, provides character translation tables (e.g. converting upper case to lower case), prints the contents of any screen, and features on-screen help menus.

Netmaster will transmit and receive programs and files, disk-to-disk, one sector at a time, enabling any DOS 3.3 file to be transmitted. There is no need to convert programs into text files. File size is unlimited.

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Michael Ginsberg	Word Processing	(805) 735-8210

Call-A.P.P.L.E. consultants are unpaid volunteers and perform a valuable service. Before placing a call, please make sure you know the time zone you are calling to. No calls after 9pm, please.

We are always looking for more consultants. If you see an area that needs coverage, please drop us a note in the mail with your qualifications and availability.

ORDER PRODUCTS LISTED ON REVERSE

Membership # _____ Expiration date _____ Date _____

Name _____ Address _____

City _____ State/Country _____ Zip _____ Phone _____

PRODUCT	Unit Price	*FOREIGN SHIPPING WT.	AMOUNT
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2			
3			
4			
5			
6			

Mail to:
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21246 68th Ave. S.
Kent, WA 98032
(206) 872-2245

VISA Account No. _____ Exp. Date _____

MasterCard Account No. _____ Exp. Date _____

Subtotal _____

**Washington sales tax _____

TOTAL AMOUNT _____

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****WASH STATE RESIDENTS ADD 8.1% SALES TAX.**

☐ APPLE // | //e PLEASE SPECIFY
☐ PLEASE USE PRODUCT NAME AND CODE WHEN ORDERING

FOREIGN MEMBERS: Please calculate postage based on weights in product descriptions. (See postage table below for cost)

FOREIGN SHIPPING CHART

POSTAL TABLE		I West Indies Central American Columbia, Venezuela	II All South American Countries (except in Table I), Europe, N Africa	III Asia, Mid East, S. Africa Australia and Pacific Islands
0 oz	1 oz	$0.50	$0.60	$0.70
1	2	.76	.96	1.16
2	3	1.02	1.32	1.62
3	4	1.28	1.68	2.08
4	6	1.54	2.14	2.74
6	8	1.80	2.60	3.40
8	10	2.06	3.06	4.06
10	12	2.32	3.53	4.72
12	14	2.58	3.98	5.38
14	16	2.84	4.44	6.04
16	18	3.10	4.90	6.70
18	20	3.36	5.36	7.36
20	22	3.62	5.82	8.02
22	24	3.88	6.28	8.68
24	26	4.14	6.74	9.34
26	28	4.40	7.20	10.00
28	30	4.66	7.66	10.66
30	32	4.92	8.12	11.32
2 lbs	2.5	5.96	9.96	13.96
2.5	3.0	7.00	11.80	16.60
3.0	3.5	8.04	13.64	19.24
3.5	4.0	9.08	15.48	21.88
Each additional ½ pound over 4 pounds		add: 1.04	1.84	2.64

CANADA SHIPPING RATES

Up to:	
1	.20
2 oz	.37
3 oz	.54
4 oz	.71
5 oz	.88
6 oz	1.05
7 oz	1.22
8 oz	1.39
9 oz	1.56
10 oz	1.73
11 oz	1.90
12 oz	2.07
1 lb	2.58
2 lbs	3.10
3 lbs	4.10
4 lbs	5.10
5 lbs	6.10
6 lbs	7.10
7 lbs	8.10
8 lbs	9.10
9 lbs	10.10
10 lbs	11.10

For weights over 10 lbs, add $1.00 per pound.

Sorry, No Foreign Hardware Orders

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☐	SEAP	E Z PILOT	$28.50
☐	SDIC	DICE	$12.50
☐	STITWR	DIRECTORY TITLE WRITER	$15.00
☐	SD6B	UTILITY DISKPAK 6B-16	$18.50
☐	SHFI	HIGHER FONTS 1	$13.00
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☐	HGRACI	C. Itoh	
☐	HGRAOK	Okidata Prowriter, Microline, NEC	
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☐	HJMACH	MACH III JOYSTICK By Hayes	$44.00
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☐	HVSLM	6' male ser. cable only	$20.00
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		PEEKing at Call-A.P.P.L.E.	
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☐	SA1	VOL 1 (Jan thru Jun 1979)	
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† Subject to Availability

Use Order Form on Reverse

The large text buffer of Netmaster can be used to save dialogue. It will even allow review of earlier portions of a conversation while receiving at the same time.

Netmaster can also be used with a language card to provide greater text buffering. The communications software of Netmaster is fully configurable, providing full control over word length, stop bits, parity, baud rate, etc.

Netmaster requires 48K Apple][,][+, or *IIe*; disk drive and DOS 3.3; and Zoom Telephonics' Networker Modem or higher-priced modems such as the D.C. Hayes Micromodem or Apple Serial Card with modem acoustic coupler. It can also be used without a modem when two Apples are hard-wired together, using a 6850- or 6552-based interface card.

In essence, Netmaster is a communications freeway for the Apple][family of computers, enabling error detection and correction for any type of file. It can send exact copies of files disk-to-disk for maximum speed and flexibility. In addition, Networker functions as a smart terminal link to data bases, remote computers, bulletin boards, etc., with simultaneous storage and display of all transmitted information, and handles files of any type and size.

The Networker Modem with Netmaster communications software is the first in a series of modem-related products being developed by Zoom Telephonics, the Boston-based producer of the popular "Demon Dialer."

Additional information from Zoom Telephonics, Inc. 207 South St., Boston, MA 02111.

ELECTRONIC INFO SERVICE AVAILABLE FREE TO APPLE /// OWNERS

Apple Computer has set up an electronic information service to provide owners of Apple /// personal computers, as well as dealers and software developers, with up-to-date product information and an electronic forum for contacting Apple /// users.

Called Apple Serve ///, the service will provide electronic mail between subscribers, a directory of software programs available for the Apple ///, software updates, a monthly newsletter from Apple, and other useful information. Subscribers will pay a nominal fee for use of the service.

Among the services on Apple Serve /// are:

- an electronic mail connection between Apple /// owners
- a bulletin board for exchanging hardware and software tips, testimonials and referrals, user group locations and meeting information, and general interest news
- an "electronic newsletter" published by Apple that will contain information on Apple ///-related products and programs from Apple and independent developers
- information on software updates and directions for obtaining them.

Apple Serve /// is provided through the CompuServe Incorporated network. Subscribers call either a local CompuServe or Tymnet/Telenet telephone number to gain access to Apple Serve ///, which is menu-driven and easy to learn to use. A modem and a telecommunications software package, such as Access III, is required.

For more information about Apple Serve /// or to set up an electronic mailbox, send name, address, and Apple /// serial number to Albert Chu, Apple Computer, Mail Stop 22-A, 20525 Mariani Avenue, Cupertino, California 95014.

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MICROSOFT Z-80 SOFTCARD CP/M	345.00	219.00
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(32K BUFF + GRAPHICS)	219.00	153.00
NEC HI-RES GREEN MONITOR (JB1201)	285.00	153.00
MICRO-SCI A2 APPLE COMPATIABLE DISK DRIVE W/O CONTROLLER	345.00	229.00
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OKIDATA MICROLINE 92/P PRINTER	699.00	498.00
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Circle 26 on Reader Service Card

Apple Computer's new Macintosh: extraordinary computing power and exceptional ease of use. Macintosh's main unit, which weighs less than 17 pounds, contains a 32-bit microprocessor, a built-in 3½-inch disk drive, a 9-inch black-on-white display, 64K of ROM and 128K of RAM. Equipped with a detachable keyboard and a mouse pointing device, Macintosh fits quickly and easily into the work style of businesspeople, professionals and students. The suggested retail price for Macintosh is only $2,495.

APPLE INTRODUCES MACINTOSH

Apple Computer today unveiled its much-anticipated Macintosh computer, a sophisticated, affordably priced personal computer designed for business people, professionals and students in a broad range of fields. Macintosh is available in all dealerships now.

Based on the advanced, 32-bit architecture developed computing power with exceptional ease of use—in a unit that is smaller and lighter than most transportable computers. The suggested retail price for Macintosh is $2,495, which during the introductory period also includes a word-processing program and graphics package.

Macintosh, along with three powerful new Lisa 2 computers, forms the basis of the Apple 32 SuperMicro family of computers. All systems in the family run Macintosh software.

Like Apple's ground-breaking Lisa computer, Macintosh uses its built-in user-interface software and high-resolution display to simulate the actual desk-top working environment—complete with built-in notepads, file folders, a calculator and other office tools. Every Macintosh computer contains 64 kilobytes of read-only memory (ROM), built-in Lisa Technology and 128 kilobytes of random-access memory (RAM) that support these desktop tools.

Users tell Macintosh what to do simply by moving a "mouse"—a small pointing device—to select among functions listed in menus and represented by pictorial symbols on the screen. Users are no longer forced to memorize the numerous and confusing keyboard commands of conventional computers. The result is radical ease of use and a significant reduction in learning time. In effect, the Macintosh is a desk-top appliance offering users increased utility and creativity with simplicity.

A wide range of software applications will be supplied by leading independent software companies. Currently, more than 100 companies are developing software and hardware peripheral devices for Macintosh. The popular Lotus 1-2-3 integrated business package will be available in a Macintosh version, and Microsoft's Multiplan financial-planning application is available immediately.

The prestigious accounting firm of Peat, Marwick Mitchell and Co. has ordered more than 2,000 Macintosh computers to be delivered in 1984.

Based on these commitments, Apple expects demand to exceed supply for several months.

Apple is manufacturing the new computers in a recently opened, highly automated factory in Fremont, California, which is capable of producing one system every 27 seconds and therefore meeting what is expected to be a large demand.

Macintosh Slashes Computer Learning Time

Macintosh is aimed at a broad group of businesspeople, professionals and college students. These people perform tasks that are similar in one important respect: they all involve working at a desk and transforming information and ideas into memos, reports, budgets, plans and analyses.

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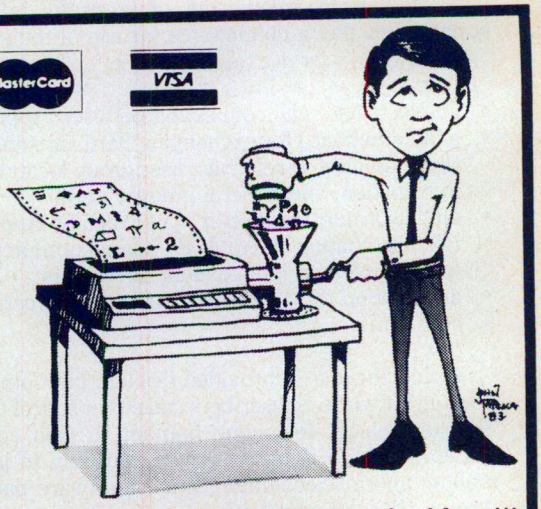

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Circle 4 on Reader Service Card

Macintosh typically takes only a few hours to learn. Its operation mirrors the activities that are carried on by people at their desks. Papers can be shuffled on screen, documents revised or discarded, charts drawn—all with a few simple commands executed with a mouse. Several documents can be displayed on screen simultaneously, in "windows" that can be moved, expanded or shrunk. All applications, from financial-planning tools to graphics programs, are based on the same set of intuitive operations. This means that numbers, words and pictures can be easily "cut" from memos, charts or graphs and "pasted" into other documents—even those created in separate application programs produced by different software companies.

Support from Leading Software Vendors

Apple expects 90 percent of all Macintosh software to come from independent software vendors. Among the prominent companies working on Macintosh applications are Microsoft Corp., Lotus Development, and Software Publishing Corp.

Apple is supporting these efforts by providing independent software vendors with Macintosh computers and comprehensive open-architecture programming documentation, classes and other development support from Apple representatives. Apple foresees at least 500 software packages available for Macintosh by the end of 1984, including productivity applications, communications packages, educational tools, specialized applications (such as accounting packages) and games.

Apple is currently providing two application programs for the Macintosh: MacWrite and MacPaint. MacWrite is a versatile word-processing program that features multiple fonts and font sizes, search-and-replace functions and the ability to cut text and pictures from other programs and paste them into memos or reports. MacPaint is a powerful illustration graphics program. Users can choose from an array of tools, such as brushes, pencils and erasers, and a large selection of textures and shapes to create an endless variety of free-form and structured images.

Programs to be released by Apple in 1984 include—for the first quarter—MacTerminal, which allows Macintosh to emulate DEC VT 100, VT 52, TTY and, with AppleLine, IBM 3277 and 3278 terminals for access to a variety of mini- and mainframe computers. In the second quarter, Apple will release Macintosh Pascal (programming package) and Macintosh Assembler-Debugger (programming package). Third-quarter releases are Macintosh Basic (programming package); MacProject, for creating flow and resource usage charts; Macintosh Logo (programming); and MacDraw, for creating structured graphics such as line graphs, pie charts, organization charts and flow diagrams.

Macintosh Features

The basic Macintosh includes a main unit, which houses a 9-inch, 512 by 342 pixel black-on-white display; a central processor; a built-in disk drive; two serial ports; built-in sound and speech hardware; a key-board and a mouse. The compact main unit occupies only a 10-inch-by-10-inch desk space and weighs less that 17 pounds—lighter than the best-selling transportable computer.

The system is based on the 32-bit Motorola 68000 microprocessor, supporting a variety of sophisticated capabilities including fast, bit-mapped graphics. Macintosh has 192 kilobytes of internal memory—64 kilobytes of read-only memory (ROM) and 128 kilobytes of random-access memory (RAM). Built into every Macintosh ROM is Lisa Technology—pull-down menus, windows and graphics routines. The ROM also contains built-in operating system and user interface functions, significantly enhancing Macintosh performance.

For mass storage, there is a built-in 3½-inch disk drive for 3½-inch diskettes. Each pocket-size diskette holds 400 kilobytes of information on one side (roughly equivalent to 100 pages of double-spaced text) and is protected by a tough plastic case. Apple's new Lisa 2 series of computers also use the 3½-inch disk drive, enabling the Lisas to run Macintosh programs.

Macintosh has two RS 232C/RS 422 serial ports for attaching a printer and peripheral communications devices such as a modem; another port for connecting an optional external disk drive; and an audio system that has a range of more than 12 octaves, is capable of producing polyphonic pitches and can replicate human speech. In addition, Apple computers, which will allow Macintosh computers to communicate with each other, peripheral devices and other Apple computers linked together. The hardware interface for AppleBus is built into every Macintosh and Lisa computer system.

Peripherals and Accessories

A number of Macintosh accessories and peripheral devices are available now: The Apple Imagewriter printer for high-quality text and graphics; an accountant-style numeric keypad; the Macintosh carrying case; a disk pack of ten 3 1/2-inch diskettes; and the Apple telephone modem, with data transmission rates of 1,200 or 300 baud. Another peripheral, AppleLine, allows Macintosh to emulate IBM 3277 and 3278 mainframe computers. An external disk drive and a security kit, which locks Macintosh and keyboard to a table or desk will be available in March 1984.

Sales and Service

Apple estimates that initially 85 percent of Macintosh sales will be made through retail channels, with direct sales making up the remainder. The Macintosh will be sold through Apple's 3,000 authorized dealers worldwide.

Designed to be marketed internationally, Macintosh uses no English language in or on the machine. Icons depict the functions of the keys, controls, ports and servicing instructions. The Macintosh ROM contains no English code, making it easy for a translator to adapt the software for use in any language. This can be accomplished within a few hours. Once the keyboard has been changed, and translator can create a "localized" version of the machine. The translator need not be familiar with programming. Localized versions of the Macintosh will be shipped to the United Kingdom, France, West Germany, Italy and Australia within three months of introduction, and to other countries within a year.

Macintosh was designed from the start to be built in the millions to meet the anticipated high demand. To that end, Apple is manufacturing the product in a specially designed $20-million facility in Fremont, California. This highly automated factory can produce one system every 27 seconds. Under terms of a "zero-defect" agreement, Apple's component suppliers will test parts according to Apple's specifications before delivery to the Macintosh factory.

Service for Macintosh will be coordinated through Apple's conventional channels, which include Apple dealers and the more than 300 RCA service centers nationwide. Macintosh was designed for simple servicing: the system is composed of only four modules, each of which can be easily replaced in the event of failure.

Price

The basic Macintosh package will have a suggested retail price of $2,495 and will include the main unit, keyboard and a mouse. The package also comes with an accessory box that contains the system disk; "A Guided Tour of Macintosh," a learning disk and cassette tape; a blank disk; a power cord; an owner's manual; and a programmer's switch.

Three new Lisa (TM) personal computers were introduced by Apple Computer, Inc. in January, 1984. All three systems share the same look and feature advanced microdisk technology. The Lisa 2, the Lisa 2/5, and the Lisa 1/10 all have 512 kilobytes of internal memory, expandable to one megabyte. In addition, the Lisa 2/5 has a 5-megabyte external hard disk drive and the Lisa 2/10 features a built-in 10-megabyte hard disk drive.

NEW LISA COMPUTER MODELS EXPAND FAMILY OF APPLE 32 SUPERMICROS

Apple Computer today unveiled its Lisa 2 series—higher-performance versions of its pioneering Lisa computer. Ranging in price from $3,495 to $5,495, the expanded Lisa 2 computers give users more flexibility in both memory and mass storage. Together with the new Macintosh, the Lisa 2 series completes the family of Apple 32 SuperMicro advanced computers and is available today at Apple dealerships across the country.

The Lisa 2 series comprises three models: Lisa 2, Lisa 2/5 and Lisa 2/10. Lisa 2 has 512 kilobytes of internal memory and a 3½-inch microdisk drive for mass storage. The Lisa 2/5 and 2/10 share these features, but offer additional mass storage: The 2/5 has an external 5-megabyte hard disk, and the 2/10 has a built-in 10-megabyte hard disk. Each computer in the Lisa 2 series can run Macintosh programs. When expanded to a full megabyte of RAM, the 2/5 and 2/10 can run the complete Lisa Office System with its integrated software.

For owners of the original Lisa, Apple is offering two upgrade options. A user can upgrade his Lisa computer to a Lisa 2/5 free of charge until June 1, 1984 (after which time the upgrade will cost $595), or he can upgrade his original Lisa to a Lisa 2/10 for $2,495.

The Lisa 2 Series

Apple's Lisa 2 series and the new Macintosh form the basis of an expanded family of products incorporating Lisa Technology, a 32-bit microprocessor, high-resolution graphics and a "mouse" pointing device.

All of the new Lisa 2 computers are equipped with the same highly reliable, compact 3½-inch microdisk drive used by Macintosh, instead of the two 5¼-inch drives used by the earlier Lisa. Software on the high-speed 3½-inch microdisks is protected by a plastic case small enough to carry in a shirt pocket.

Like the earlier Lisa, the computers in the Lisa 2 series are exceptionally easy to use and are designed for a broad range of general business tasks as well as specialized applications in such fields as engineering and architecture.

In addition, Apple is developing the AppleBus point-to-point interconnect system for its computers, which will allow Lisa 2 computers to communicate with each other, peripheral devices and other Apple computers linked together. The hardware interface for AppleBus is built into every Apple 32 SuperMicro computer.

Price and Availability

The Lisa 2 series computers are available now. International models will be available in France, Great Britain, West Germany and Italy within a month.

U.S. suggested retail prices are as follows:

Lisa 2:	$3,495
Lisa 2/5:	$4,495
Lisa 2/10:	$5,495
.5 megabyte add-on memory:	$1,495
LisaList:	$195
LisaTerminal:	$295
LisaWrite:	$295
LisaCalc:	$295
LisaGraph:	$295
Lisa Office System Diskettes:	$295
LisaDraw:	$395
LisaProject:	$395
Lisa 2/5 upgrade: (free until June 1)	$595
Lisa 2/10 upgrade:	$2495

MACINTOSH PERIPHERALS ANNOUNCED

Mac Disk, with a complete family of peripheral products designed to expand the new Apple Macintosh personal computer into a powerful and flexible business tool, was announced today by Davong Systems Inc.

Available in first quarter of 1984 through Davong's national network of 1000 dealers are hard disk storage systems ranging from 5 to 32 megabytes. Scheduled for introduction soon are a 28 megabyte streaming tape backup system and a multi-tasking local area networking system.

"Our goal was to develop reasonably-priced peripherals that increase Macintosh's capacity and enhance its use in business applications without sacrificing any of the speed and ease of use built into Macintosh," said Dave Jorgensen, Davong's director of marketing. "We have accomplished this with Mac Disk."

Mac Disk will be especially useful in handling accounting, database management and other big data applications, Jorgensen predicted, and the tape back-up will provide users with an extra level of confidence in protecting data. Mac Disk will be shipped with all necessary cabling and adapters, software utilities and comprehensive documentation.

Jorgensen said Davong is also excited about the potential of Mac Link, a local area networking system that will allow up to 255 Macintoshes in an organization to share hard disk storage, communicate with each other, and share other resources such as printers and plotters.

Mac Link will incorporate much of the hardware and software technology Davong developed for MultiLink, Davong's local area network solution for IBM PCs and XTs. "Mac Link will feature the same flexibility, performance and economy that has made MultiLink so successful," Jorgensen said.

Davong Systems Inc. was one of the first companies to jump into the add-on industry for popular microcomputers. Since its start early in 1982, the firm quickly established itself as one of the leaders among a field of more than 30 competitors. Sales have jumped from $6.5 million in its first year of operation to nearly $30 million in 1983.

One of Davong's first products was a Winchester hard disk system compatible with the Apple][, *IIe* or ///.

"We believe that our superior technology and commitment to quality at a reasonable price were primary factors in Apple's selection of Davong to develop compatible products for the Macintosh," said Jorgensen. "We make a good product and have a strong distribution and service network so we have a lot to offer Macintosh buyers."

Inquiries on Mac Disk should be directed to David Jorgensen, director of marketing, Davong Systems Inc., 217 Humboldt Court, Sunnyvale, CA 94089 (408) 734-4900.

MOUSE AVAILABLE FOR APPLE][COMPUTERS

Apple Computer demonstrated a mouse and new software called MousePaint, which it will offer early in 1984 for its Apple®][personal computers.

A mouse is a pointing device that can be used instead of a keyboard to select computer operations and modify information displayed on the screen. Apple's Lisa™ computer, introduced last year, ignited broad interest in the mouse among computer owners, software developers and other computer manufacturers. The Lisa is designed to be almost completely controlled by a mouse, one of the things that makes it much easier to use yet more powerful than conventional computers.

"The market's response to mouse technology on the Lisa clearly indicated that computer users were ready for input devices that offer greater flexibility than a keyboard," said John Cavalier,, vice president and general manager of the Personal Computer Systems division. "The mouse option opens up a new dimension of utility on our Apple][product line and again demonstrates Apple's commitment to enhance the value of its products with new technology."

AppleMouse II will be packaged with MousePaint software that uses the mouse to design charts, diagrams, free-hand drawings and other visual aids for reports and presentations. Users can insert text in a drawing and can choose from a variety of character fonts and fill patterns. MousePaint simulates bit map graphics to support the Apple][']s high resolution capabilities.

- Recursion
- Interactive Graphics
- Quizzes
- Word Games
- Artificial Intelligence programming

In addition, over 40 programming projects and their solutions are included in the 142-page document.

Prices for Terrapin Logo Version 2.0 and the new documentation were listed as follows:

- $149.95 suggested retail for the complete Logo package, including language disk, full documentation and utilities disk.
- $12.50 for the new "Words and Lists" chapter.

Owners of Terrapin Logo Version 1.3 may update to Version 2.0 for $20.00 and obtain the new "Words and Lists" chapter for an additional $5.00.

Terrapin Logo is available from many computer and software retailers, and from most major software distributors. Terrapin, Inc., is located at 380 Green Street, Cambridge, MA 02139, Telephone: (617) 492-8816.

INSTRUCTIONAL/COMMUNICATIONS TECHNOLOGY, INC. TAYLOR ASSOCIATES
10 Stepar Place, Huntington Station, New York 11746 (516) 549-3000

PROFILE TO SUPPORT APPLE][

CUPERTINO, Calif. — Business professionals who use Apple®][personal computers can now add the storage capacity and increased performance of ProFile, Apple Computer's Winchester-technology disk drive.

ProFile use with an Apple][is made possible by two new software products from Apple:

- ProDOS, Apple's new operating system for the Apple][, enables the computer to communicate with mass storage devices such as ProFile. ProDOS provides hierarchical file management and fast disk access, features that are particularly beneficial to ProFile users.
- The Apple Pascal Development System has been revised to support ProFile.

Any application based on ProDOS or Pascal (Version 1.2) can use ProFile. There are presently over 400 companies licensed to develop ProDOS-based applications for the Apple][.

ProFile offers storage capacity up to the equivalent of 35 floppy diskettes—about 1200 single-spaced, type-written pages—and retrieves information ten times as fast as a conventional floppy disk drive.

Backup Capability

ProFile is packaged with Backup II, a software utility that backs up and restores files stored on ProFile. With Backup II, all stored files, even those too large for a single floppy diskette, can be transferred to and stored on back-up floppies.

If data needs to be restored on ProFile, Backup II users can restore just one file, a particular collection of files, or the entire contents from the back-up diskette. The utility also allows users to back up only those files which have been updated since the last time a backup was made, or since a specific date and time.

System Requirements, Price and Availability

ProFile can be used with Apple][, Apple][+ or Apple *IIe* computers that have 64 or more kilobytes of internal memory. In addition to Backup II, purchasers of ProFile for an Apple][will receive an interface card to connect ProFile to one of the computer's expansion slots and a software utility to manage Pascal files on ProFile.

ProFile for Apple][personal computers will be available in mid-January, 1984 from authorized Apple dealers worldwide. Its U.S. suggested retail price will be less than $2200.

APPLE /// PLUS ANNOUNCED

Apple Computer today introduced an enhanced version of the Apple /// business computer system, the Apple /// Plus, that incorporates convenient new features and updated hardware.

System improvements include:

- an interlace video mode which doubles the screen resolution of both text and graphics
- a clock/calendar function that works with business software programs such as appointment calendars and "tickler" files
- an Apple *IIe* style keyboard with re-positioned cursor control keys and a "delete" key
- a re-engineered main logic board and other system hardware modifications that improve the reliability of the system
- revisions of the Sophisticated Operating System, SOS 1.3, and system utilities that support the hardware changes

The Apple /// Plus retains all of the features that have made the Apple /// one of the most versatile personal computer systems for business applications: standard main memory of 256 kilobytes; a built-in, 140-kilobyte floppy disk drive; 80-column, upper and lower case character display with optional character set fonts; a fully programmable typewriter-style keyboard with a 13-key numeric keypad; built-in, 16-color graphics; a custom-designed, high performance microprocessor; and an advanced operating system that insures file compatibility among all software applications and that allows any peripheral device to be easily added to the system.

Built-in ports allow quick connection of peripherals such as printers and telephone modems. Four internal expansion slots support the addition of other accessories, such as mass storage systems, plotters and cards which provide alternate operating systems.

The newest Apple /// is 100 percent compatible with the more than 400 business software programs available for the Apple ///. In addition, more than 1,500 CP/M™-based programs will run on the Apple /// Plus when it is equipped with a SoftCard™ ///. Most Apple][software that requires 48 kilobytes or less of main memory will run in the Apple][emulation mode that's built into every Apple /// Plus. Also, new Apple][software based on ProDOS has the same data file structure as SOS files, allowing these files to used on either an Apple][or an Apple ///.

System Enhancements

An *interlace video mode* has been added to the Apple /// Plus that effectively doubles screen resolution. The computer scans both normal lines and between normal lines, which gives the appearance of solid lines instead of dots. The user can turn interlace mode off and on by means of a switch on the side of the computer. Currently available software and monitors, including Apple's Monitor ///, take advantage of the interlace mode without alteration.

With the new *clock/calendar function,* the /// Plus keeps track of date, day of the week, and time to 1/1000th of a second. Users can date and time-stamp files and track sequences of events-useful features for many business applications, as well as for programming and backing up files.

Both the interlace mode and clock/calendar function can be added to Apple /// systems with upgrade kits. The Interlace Upgrade Kit has a suggested retail price of $75 plus installation; the Clock/Calendar Kit is $35 plus installation.

The new *keyboard* is identical to the Apple *IIe* keyboard, featuring re-positioned cursor control keys and a new "delete" key. The keyboard provides several options to the user, including alternative character set fonts, and programmable function keys. Designed for serious business use, the Apple /// Plus keyboard offers a choice of either the QWERTY or DVORAK key layouts.

Hardware modifications include:

- a redesigned, four-layer main logic board that increases system reliability and reduces radio frequency emissions
- improved peripheral ports on the back panel that use standard DB-25-pin connection
- modified slot housings for easier insertion and removal of peripheral cards
- an upgraded, 55-watt power supply that allows the computer to run cooler
- new casting which provides better heat dissipation and meets standards for Class B computers set by the Federal Communications Commission and similar international organizations.

Pricing and Availability

The Apple /// Plus, Available this month from authorized Apple /// dealers, has a suggested retail price of $2995. Included with the system is an accessory kit that provides users with all components necessary to begin using the /// Plus: SOS operating system, System Utilities disks, Owner's Guide, Device Drives Guide, Apple][Plus Emulation Mode disk, Confidence Program for self-testing, and Business BASIC demonstration disk. Also included is a new starter pack that features an introductory manual, interactive training disks and a system utilities.

NEW LINE OF TECHNICAL PRODUCTS FROM APPLE COMPUTER SUPPORTS DEVELOPERS

A series of technical products designed to help developers create applications for Apple® computers was announced today by Apple Computer. Called Apple Workbench, the product line includes development tools and technical information for hardware and software developers.

"Apple has always encouraged third parties to develop applications for its computers," said Norma Odenweller, manager of developer relations. "Now, through the Workbench product line, we are opening up our systems to developers even more to make hardware and software development for Apple computers as easy and productive as possible."

The first group of Workbench products consists of six software packages for the Apple][and Apple /// product lines:

- The DOS Programmer's Tool Kit provides the tools needed to program an Apple][computer in both assembly and Applesoft Basic under DOS 3.3. Software utilities are included for developing and using special text animation character sets, as well as Boston Window, a full-screen editor.
- ProDOS Technical Reference Manual explains how to develop applications using the advanced features of ProDOS, Apple's new operating system for the Apple][family. A diskette is included that contains an interactive program to allow programmers to test ProDOS function calls from the keyboard.
- The ProDOS Assembler Tools package contains the software utilities needed to program an Apple][computer in assembly language under ProDOS. The ProDOS Technical Reference Manual is recommended for use with this package.
- Apple Pascal Numerics provide units that allow programmers to use single, double and extended-precision real and integer numbers in Apple Pascal for the Apple][and the Apple ///. The package incorporates full IEEE-standard numerics and includes a variety of mathematical functions.
- The Apple /// Pascal Tool Kit helps programmers develop Pascal programs on an Apple /// computer. It includes utilities for performing programming functions such as compiling Pascal code, comparing data text files, designing a good user interface to the program, and sorting SOS and ProDOS directories.

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- Pronto: The Apple /// Pascal Debugger enables developers to control the execution of Apple /// Pascal programs. Users can debug while executing programs at full speed, and no recompilation is necessary.

The Workbench products are for technically-skilled developers who require little or no tutorial information. Technical reference materials provided with each Workbench product are in a loose-leaf format, with separate binders available so developers can organize the reference materials to fit their individual needs. The loose-leaf format was selected to facilitate updates.

The DOS Programmer's Tool Kit, the ProDOS Technical Reference Manual, Apple Pascal Numerics and the Workbench binders will be available soon from authorized Apple dealers worldwide. The ProDOS Assembler Tools, the Apple III Pascal Tool Kit and Pronto: The Apple III Pascal Debugger will be available by March, 1984.

Each product is purchased separately and includes documentation. More products will be added to the Apple Workbench series in the future.

Independent software developers are being encouraged to write applications that take advantage of the mouse. Most future Apple software programs for the Apple][family will offer the mouse as an option.

Apple also is developing a mouse to work with Apple /// personal computers.

TERRAPIN RELEASES LOGO VERSION

Cambridge, MA — Terrapin, Inc., has announced Version 2.0 of its Logo language for the Apple][,][+ and *IIe*. Significant enhancements over the current Version 1.3 include:

- The addition of 6 new primitives and several editor commands
- Improved "garbage collection" capabilities, available for the first time on any Apple-compatible Logo
- Full-function support for all 4 cursor keys on the *IIe*
- Ability to read program files created under Apple Logo.

For the user, these enhancements deliver several benefits. One of the new primitives, for example, allows easy switching between two different disk drives. Movement of text is made simpler by a YANK command. And the improved "garbage collection" virtually eliminates the problem of running out of workspace.

In the second announcement, Terrapin has released enhanced documentation with an extensive "Words and Lists" chapter in its Logo manual. According to the company, the chapter is the most comprehensive treatment available of the word and list handling features of the Logo language. Topics treated in depth in the new documentation subset include:

THE THUNDER C COMPILER

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LOW-COST C COMPILER

With the Folksoft CC02 compiler, you can write programs in the C language for your Apple][or *IIe*. C is a modern, structured, high-level language. Programs in C take less time to write than programs in assembly language and are faster than programs in BASIC. Unlike Pascal, programs written with the CC02 compiler use standard DOS disks and can read and write all the DOS file types.

The CC02 compiler accepts a subset of the standard C language. Among the statements accepted are the if, else, while, return, break, and continue statements. Over 20 C operators are available including the arithmetic and comparison operators which most languages have plus useful operators such as bitwise AND, bitwise Or, shift right, shift left, increment, and decrement. The data types are integer variables (16 bits), character variables (8 bits), pointers (for indirectly accessing variables), and integer and character arrays. CC02 functions can have arguments and local variables. Functions are recursive so a function can call itself.

The CC02 compiler has a library of 39 I/O and general-purpose functions. Most of these functions are equivalents of standard Unix library functions.

Also included with the compiler is a command-line processor called the shell. The shell accepts Unix-like commands to run C program, redirect I/O, and pass command-line arguments. C program I/O can be redirected so the device used for input or output is a peripheral slot, a disk file, or a user-written I/O routine.

The compiler comes with a 65-page manual. The manual describes the library functions, the shell, and the procedures for editing, compiling, and running C programs.

The CC02 compiler requires 48K, DOS 3.3, and either the DOS Toolkit or the Big Mac.LC assembler.

The cost is $38.50 and includes shipping in the U.S. To order or for more information, contact: Folksoft, Dept. C3, P.O. Box 441, Fayetteville, NY 13066. (315) 656-7447

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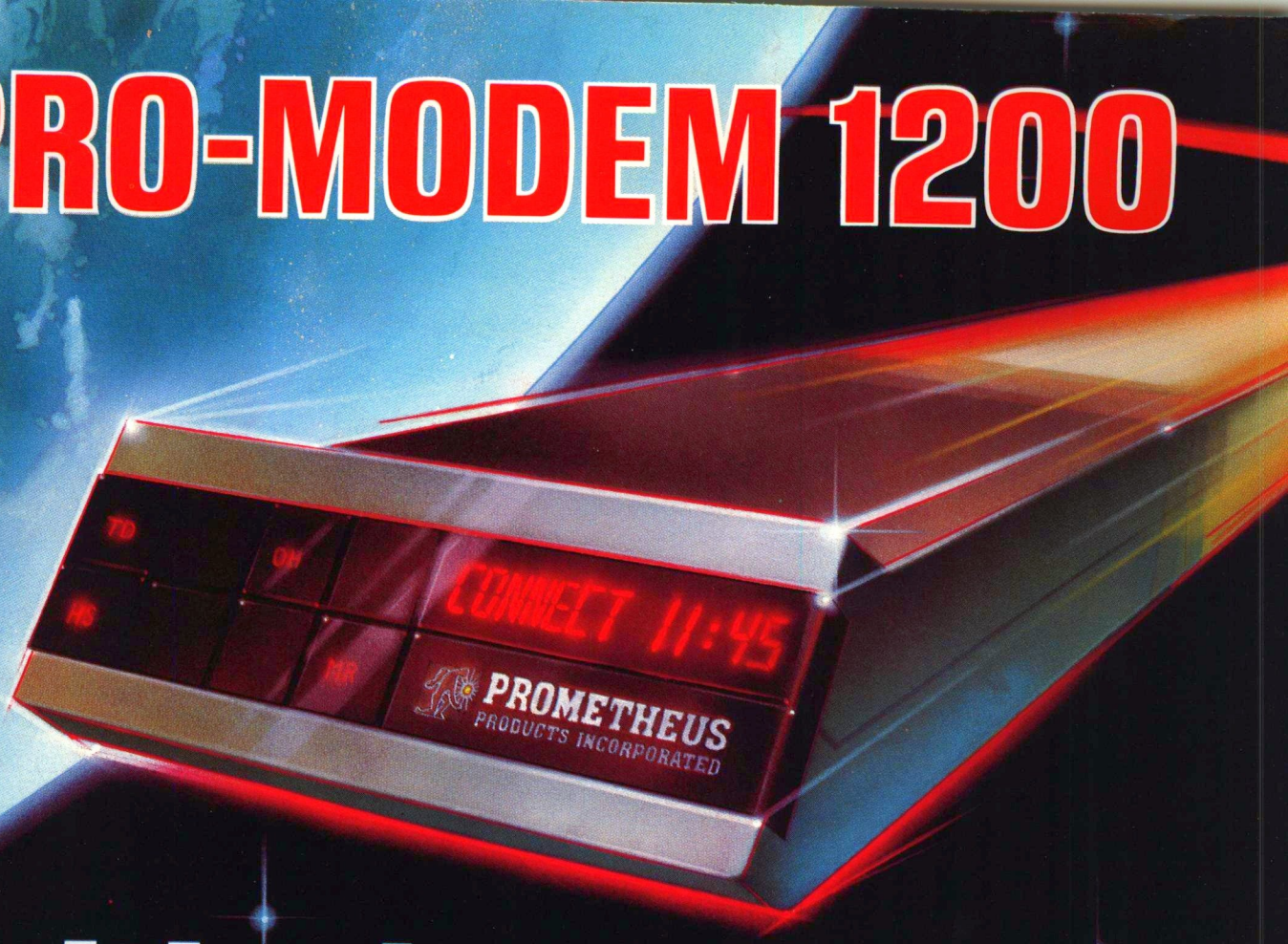

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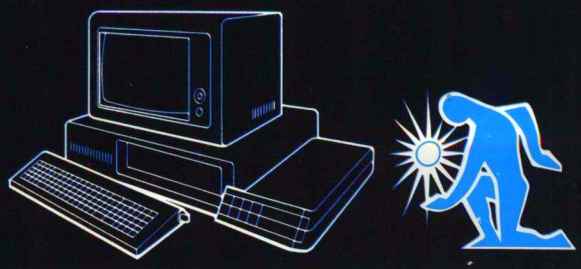

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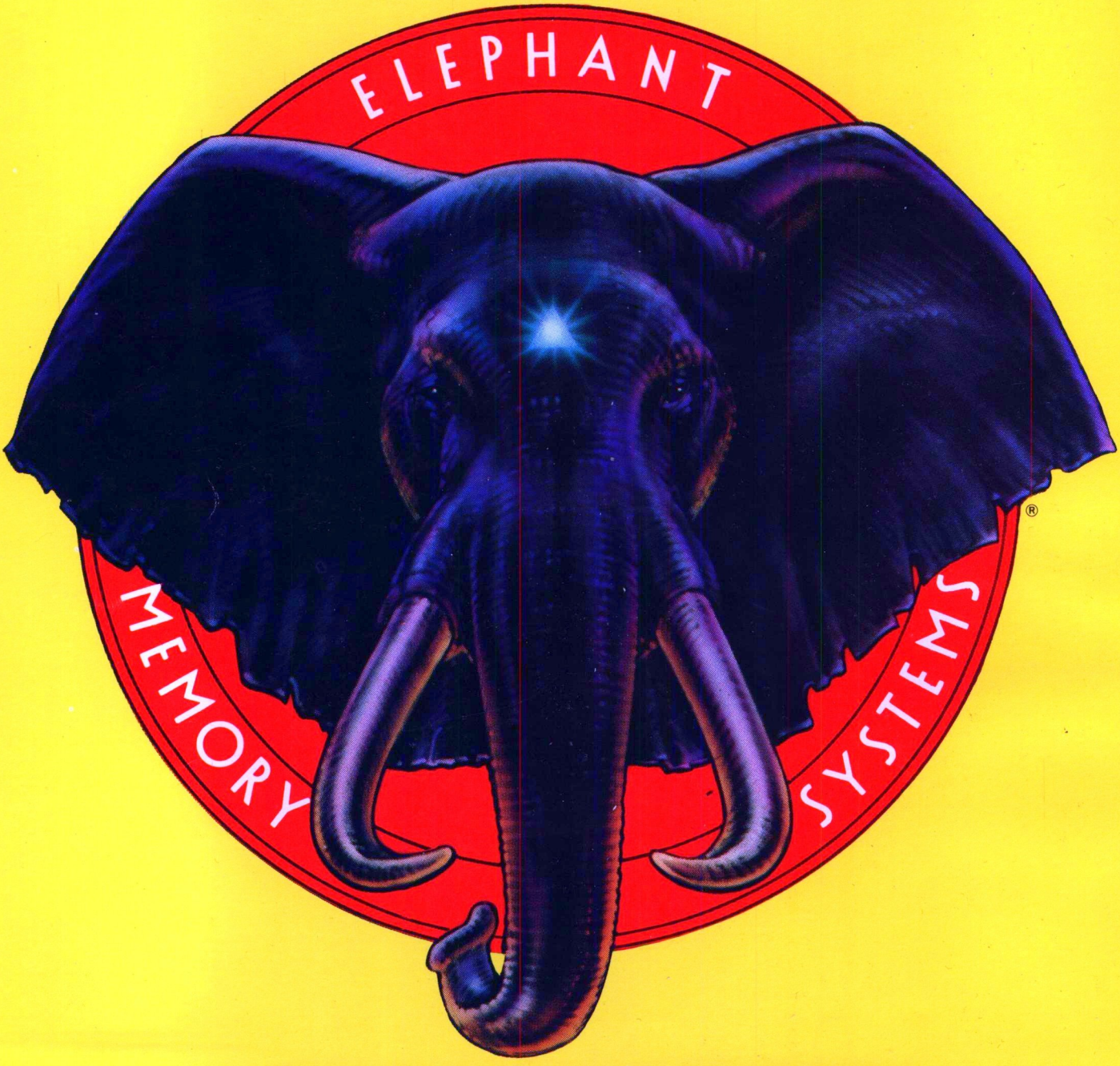

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